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# Veterinary Medicine

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## CATTLE TUBERCULOSIS RAPIDLY REDUCED BY AREA PLAN

Carrying the campaign of eradicating animal tuberculosis to areas where it is very strongly entrenched is one of the newer developments in the nation-wide program to rout the disease. A survey just completed by the Bureau of Animal Industry, United States Department of Agriculture, shows the aggressive action taken by many counties.

The eradication of tuberculosis under the "area" plan is now being conducted in 34 of the 98 counties having more than 15 per cent of tuberculosis infection among cattle, and in 54 of 165 counties containing cattle that are tuberculous to the extent of more than 7 per cent but not more than 15 per cent. Thus, about one-third of the most badly infected counties have eradication work under way. Two of the counties, formerly very seriously affected, have already reduced the infection to 0.5 per cent or less and are in the "modified accredited area" class.

There are 241 counties in the country where tuberculosis among cattle exists to the extent of more than 3 per cent and up to 7 per cent. Of these counties 93 are conducting area work to eradicate the disease and 8 of them already have qualified as modified accredited areas. The work is also going forward rapidly in the more lightly affected areas where sentiment strongly favors eradicating the disease before it becomes more serious. At the beginning of 1926 the list of modified accredited areas totalled 149 counties, thus indicating excellent progress toward the conquest of the disease.

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An increase in three years of more than 100 per cent in the number of purebred sires owned in Kentucky has been reported to the United States Department of Agriculture. The improvement was in all classes of livestock, including beef and dairy cattle, swine, sheep, and poultry. During the last year extension workers aided stockmen in obtaining more than 500 purebred bulls and many more were placed through other means.

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The number of farmers has fallen off 25 per cent per million of population in fifty years. Farmers have been absorbed by the vast spreading sponge of industrial employment. Gains are noted for all manufacturing employment of 85 per cent per million population, since 1870.

Iron and steel workers have multiplied by 558 per cent and office and clerical help by 1,285 per cent. The use of machinery has caused boot and shoe makers to dwindle by 35 per cent. There are 40 per cent fewer plasterers.—Figures from National Industrial Conference Board.

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In his 1925 annual report of hog cholera work in Maryland, Dr. I. K. Atherton, Inspector in Charge, U. S. B. A. I., College Park, Md., gives some interesting figures, showing that 2158 hogs were treated by veterinarians and 422 by laymen, with the following results:

Percent that survived, treated by laymen .....71
Percent that survived, treated by veterinarians .....77
Percent that survived that were apparently well when treated by veterinarians .....92
Percent that survived that were apparently well when treated by laymen.....87
Percent that survived that were sick when treated by veterinarians.....31
Percent that survived that were sick when treated by laymen.....26

Thus for every 100 hogs treated by veterinarians as compared with the same number treated by laymen, six more were saved by

professional services as contrasted with lay immunization. Dr. Atherton gives the average value of hogs in Maryland as $12.90 per head, and on this basis, veterinary services represented a monetary saving over lay vaccination of $77.40 for every 100 hogs or about three times the cost of veterinary services.

## OHIO VETERINARIANS

Most of us would hesitate to become a veterinary surgeon,—a "horse doctor,"—when a horse is a rare sight on our crowded highways.

But we would be wrong about the veterinarian. The horse is far from obsolete. There are more horses in America today than there were twenty years ago. Ohio has 750,000 of them on its farms, where the horse is a necessity, doing many things an auto cannot do and going many places a tractor cannot go.

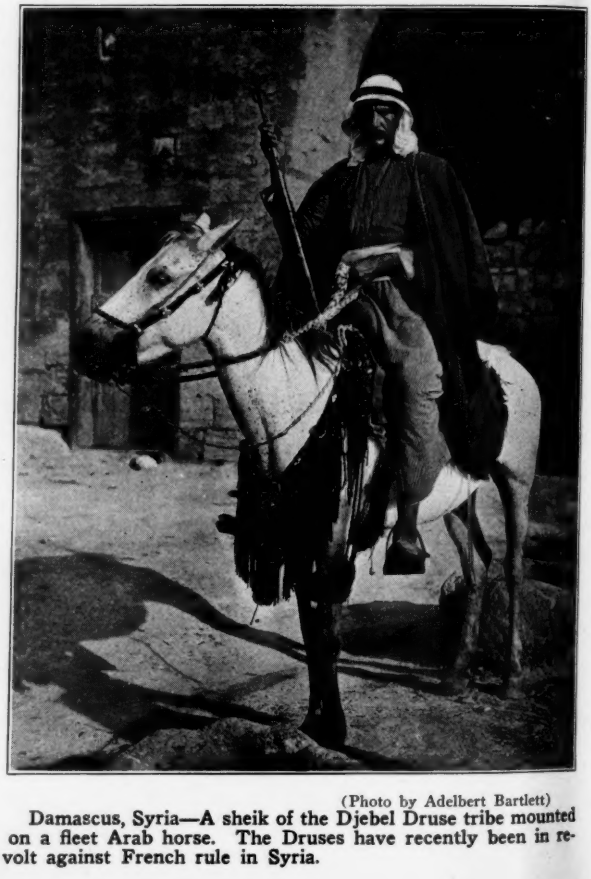
A good farm horse is worth more today than he ever was and the price of a fine draft horse never was so high as it is now. So the farmers and the city transportation companies guard the health of their horses, which means work for the veterinarian.

But the veterinary surgeon of today is much more than a "horse doctor." He is an expert on all animal diseases. Most of his ability is devoted to other domestic animals. At their recent state convention, three hundred prosperous "vets" and their wives heard papers read on diseases of hogs, sheep, cattle and poultry with particular emphasis on the housing, care and feeding of livestock to eradicate their common ills.

So, instead of having been banished by the auto, we find the Ohio veterinarian busier today than ever before and more useful in an enlarged field that protects the health of our livestock and guards our meat supply.—Akron, Ohio, Times-Press.

## LIFE SPAN INCREASED TODAY

Are we downhearted? No, not at all, and for the following good reasons: In 1800 the average length of life in the United States was 33 years. Today it is 58 years. Public health work has been responsible for a life-saving record that is remarkable. And think what this means to the wealth of our country. It is estimated that every year added to the life of an average man is worth $500 to the nation.—H. N. Bundesen, M. D., Health Commissioner, Chicago.



(Photo by Adelbert Bartlett)

**Damascus, Syria—A sheik of the Djebel Druse tribe mounted on a fleet Arab horse. The Druses have recently been in revolt against French rule in Syria.**

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# The Relation of the Veterinarian to Livestock Production*

JOHN R. MOHLER, Chief, Bureau of Animal Industry, U. S. Department of Agriculture

IN DISCUSSING the relation of the veterinarian to livestock production there are naturally two points of view. One is that of the veterinarian himself, whose work is professional and who renders a definite service, often of an emergency character. The other viewpoint is that of the stock owner who naturally is inclined to consider the service of the veterinarian from an economic standpoint. The stock owner is in the business of producing animals and selling them and their products. In the case of work stock he depends on the veterinarian for curing their ills and otherwise keeping them fit. From the producer's standpoint veterinary service is in the same general class as various kinds of insurance against the hazards of the business.

## A Widening Range of Service

In dealing with this question I shall endeavor to recognize both points of view and to balance so far as possible the professional and the economic aspects of the subject. Within the last ten years the nature of veterinary service has undergone important changes. There is less horse practice than formerly, but, on the other hand, a much greater amount of attention to diseases of other animals. The veterinary colleges have raised their requirements materially. A high-school education is now essential even for entering an accredited veterinary college, and the course now is of four years' duration as compared with three, and even less some years ago. The change has come about partly as the result of Federal requirements in admitting veterinarians to the government service for which properly qualified men are needed in considerable numbers. Sentiment within the profession also has favored the more rigid educational requirements, thereby placing veterinary medicine on a par with human medicine, engineering, chemistry, and scientific agriculture.

Within the last ten years knowledge of veterinary science also has increased tremendously. This is particularly true in the control and prevention of livestock losses due to parasites. The life history of the roundworm of swine, a very serious detriment to hog raising, has been known only within the last five years. Effective methods of control are now possible through the knowledge obtained. Progress in controlling tuberculosis of cattle, swine, and poultry has been very rapid within the last decade, due to new knowledge and better methods of suppressing this dread malady. Current knowledge regarding plants poisonous to livestock also is vastly more extensive now than a few years ago.

These brief sidelights illustrate the present wide range of service which skilled veterinarians are prepared to render. Compared with the practitioner of ten years ago or more they have a better scientific background, a much greater appreciation of sanitation as a means for combating diseases and parasites, and their training also gives them a clearer conception of the livestock owner's business. Veterinarians of today are more fully versed in problems of animal husbandry, of breeding and feeding, and in means of reducing mortality of young animals. In other words, the service is much broader than that of treating animals from an anatomical or surgical standpoint. I am sure you will agree that this development is desirable, for it results in more mutual understanding and appreciation of the stock owner's problems and point of view. An instance which recently came to my attention illustrates this point. A Bureau of Animal Industry veterinarian,

*Read by Dr. H. B. Raffensperger, in charge B. A. I. Zoological Laboratory, Chicago, at University of Illinois short course for farmers, Urbana, Ill., Jan. 20. 1926.

assigned to investigations of sheep diseases, traced to faulty management more than three-fourths of the losses, formerly attributed to disease. In the great majority of cases the faulty management was due merely to poor feeding, generally to overfeeding when sheep were transferred from range pastures to feed lots. This may seem surprising to you and it may be inferred that any observing stockman would have reached the same conclusion. Yet the facts do not support such an assumption. Many of the sheepmen had been in the business for years and had suffered losses of thousands of animals. In several instances the owners stood helplessly by while their sheep died, believing that the visitation of some mysterious disease was the cause, whereas veterinary investigation showed that improper methods of handling the animals and too sudden changes of feed were the sole causes. No infectious disease whatever was present.

**Trained to Analyze and Solve Problems**

Through his special training and experience the veterinarian sees and corrects conditions in livestock production in much the same manner that an expert in any other profession renders a service which, though sometimes simple, is beyond the capacity of the layman to do for himself. A recent instance illustrates this point. In the course of play a dog bit a small boy. It was the first time that the dog had bitten any one although the owner admitted that the boys had sometimes tormented the animal. Ordinarily the dog was well behaved. The owner took the dog to a veterinarian the next day to learn whether it might be affected with rabies. A mere glance at the animal showed that the typical symptoms of rabies, such as the depressed condition, glazed eyes, dilated pupils, and tendency to snap when touched, were entirely absent. There was nothing the matter with the dog. Considering the time that had elapsed since the biting occurred, the animal, if affected, would have developed certain marked symptoms of the disease. Here was a service that reassured the boy's father and saved the dog's life, yet a moment's observations by a trained veterinarian was more dependable than the years in which the owner of the animal had been familiar with dogs.

**Importance of Disease Prevention Being Recognized**

The simple incident just mentioned also illustrates a growing tendency to take prompt steps toward preventing serious conditions from arising. There appears to be less reluctance among people to consult physicians, dentists, and veterinarians than in former years. Probably this is the result of education and of a general desire to obtain dependable facts before a crisis occurs.

A remarkable illustration of this change of public sentiment is the attitude of livestock owners toward bovine tuberculosis. Most of you recall from your experience the resistance of cattle owners to proposed legislation on tuberculin testing. Opposition was sometimes of the most vehement kind. Yet records of the Bureau of Animal Industry show that in the present systematic work to eradicate tuberculosis there has been a waiting list in nearly every state. At the end of the last year, owners of more than three million cattle had filed applications for testing in excess of the ability of the State and Federal veterinary forces to keep up with the demand. Aside from the satisfaction of knowing that one's cattle are healthy and are not a menace to the human race, it pays in a business way to detect any affected animals before the disease spreads through the herd. The reasoning and the conclusion are both extremely simple and obvious, yet only within the last few years has there been a wide realization of this principle of disease-control work.

Through his training and practical experience the veterinarian, when visiting a farm, observes many conditions having an important bearing on profitable livestock production which the owner of the farm may not see because of a lack of specialized training. The old-fashioned, mud hog wallow comes to my mind as an example. True, it is the hog's refuge from summer heat and annoying external parasites, but it is also a harboring place for the eggs of serious parasites that live within the animal. The hog considers its immediate comfort

and the stock owner, basing his conclusion on the hog's habits, has tolerated and even provided mud wallows for years. Yet veterinary science strongly advises in its stead a shaded, concrete hog wallow, preferably containing a weak disinfectant. As a matter of fact, wallows of any kind are not essential for the comfort of hogs provided their lots are kept sanitary, free from lice and mites, and when adequate shade is provided.

Most persons in this audience are familiar at least with the principle of roundworm control as worked out in McLean County, Illinois. This plan, though developed by scientists and veterinarians, is essentially a system of swine sanitation and management, and as such is now widely used in the principal hog-growing states. Extension workers in Iowa, Nebraska, and elsewhere are active in acquainting swine growers with the method that has so greatly reduced losses formerly caused by roundworms. Reports show that some swine growers are now raising about as many pigs as formerly with only two-thirds as many brood sows. This is a rather striking example of the close relation of the veterinarian to livestock production. The system prevents death losses and runtiness almost entirely. From the stockman's standpoint the system means more pounds of marketable pork, at no greater cost of production. During the last year continued investigation on this subject involved observations on about 9,000 pigs on 20 farms. Results confirmed those I have just outlined.

The method of preventing hog cholera by the serum treatment is too well known to require discussion, but this is a suitable occasion to stress the necessity for proper dosage, skillful work, and sanitation during the operation, and in caring for the hogs afterwards.

When calling a veterinarian to your farms I suggest also the advisability of consulting him in the control of respiratory diseases of swine. These are due usually to damp quarters, cold floors, and exposure to cold rains and winds. The respiratory diseases include pneumonia, pleurisy, and so-called "flu." The conditions mentioned also are responsible for many chilled pigs. There has been an unfortunate tendency in livestock production to accept serious losses as inevitable. Veterinary science, on the other hand, challenges the necessity of such losses and is constantly inquiring into the whys, wherefores, and means of reducing them. A study of this question, under typical conditions, showed that of 200 pigs farrowed, both dead and alive, only 128 were successfully weaned at 10 weeks of age. This is a staggering loss. Although it is perhaps not possible to reduce it entirely, careful swine owners are making progress in cutting the loss to a minimum.

The remarkable success of the so-called ton-litter contests shows what can be done in contrast to common experience. In this connection I may add that the McLean County system of swine sanitation has become a helpful adjunct in some of the most successful ton litters.

Looking at the mortality of young pigs from the standpoint of livestock production, Department specialists have found that a pig dying at any time from farrowing to weaning represents a loss of 1¾ pounds of feed for every day it lived. By applying current feed prices to this figure you can readily calculate the money loss. And most swine owners will find that this loss alone probably will exceed many times the amount they have paid for veterinary service during that year. This point suggests that timely veterinary service may materially reduce the feed bill which is so often a large item on stock farms.

Thus far our discussions of veterinary work and livestock production have dealt with problems near at hand and with diseases and ailments with which stockmen are personally familiar. The work of the Bureau of Animal Industry naturally results in much information of national scope, and in which individual stockmen may have slight personal interest. Yet I feel that it is well for persons engaged in livestock production to be familiar with such matters since one can never tell when a problem which now seems remote may affect him in a personal way.

The Federal meat-inspection service, con-

ducted by the Bureau, is of course an important protection to the general public with respect to the wholesomeness of meat handled by establishments doing an interstate or foreign business. Meat inspection records, however, give exact information each year concerning the health condition of animals slaughtered under Federal inspection. The number in recent years has exceeded 70 million annually, being about two-thirds of the estimated total and making the federally inspected slaughter a good basis for study. Tuberculosis is by far the most serious animal disease in the United States and is responsible for condemnation of the largest number of whole carcasses and parts. Hog cholera is second. There are between 30 and 40 other diseases and ailments responsible for the failure of meat to pass inspection, but they occur so infrequently compared with tuberculosis and hog cholera that they do not constitute nearly so great a menace to the industry. I mention these facts so that Federal and State officials may have your cooperation in suppressing these maladies.

**Tattoo Method of Marking Hogs**

It may be of interest to swine owners especially to learn that veterinarians of the Bureau lately have developed a means of tattooing hogs on the farm, in the feed lot, or when ready for market so that their carcasses later may be readily identified. The method is extremely rapid and simple and promises to be an effective means for determining the source of various diseases affecting swine. In other words, when a veterinary inspector finds a tuberculous condition, for instance, in a hog carcass identified by a certain tattoo mark, it will be possible to trace the origin of the animal to the farm from which it was shipped. This method promises to be especially useful when lots of hogs owned by several farmers are shipped in the same car and are sold subject to inspection. Instead of prorating among the various shippers the cut in price, due to disease, it will be possible to charge the diseased hogs against the account of the farmer who shipped them. In fact, this was done in connection with experimental work in developing the tattoo method. You will readily see that the producer of sound, healthy hogs benefits by such means of identification and that it should result in tracing and stamping out centers of infection.

I mention this subject in view of the possibility that individuals and organizations represented here may wish to cooperate with the Bureau in putting the tattoo method of marking hogs into effect in their communities.

Another national veterinary problem which may at any time affect livestock owners personally is the interstate movement of live animals. Current regulations permit such movement under a system of inspection which aims to facilitate commerce and business relations among the various states and yet prevent the spread of animal diseases and parasites. Compliance with these regulations has been satisfactory for the most part, yet scarcely a month passes but that some stock owner is fined $100 or thereabouts for moving tuberculous or ticky cattle from one state to another. The transportation companies and livestock dealers also are frequent offenders. I can not emphasize too strongly that such regulations are for the benefit of the livestock industry and the general public. The regulations may cause some irritation and slight delays at times while necessary tests or dippings are made, but the value of reasonable restrictions is not only evident to every thinking person but has been proved of immeasurable importance in keeping animal diseases within control.

**Watching for Microbian Immigrants**

Extending the system of inspection still farther we reach the international phases of veterinary work. Its purpose is to exclude from the entire United States animal scourges that are present abroad and which if introduced here would cause staggering losses, to say nothing of constant fear and anxiety as to where the next outbreaks might occur. The United States contains nearly 200 million head of domestic animals and the entire livestock industry is worth about eight billion dollers. Not only do we have the largest aggregate of domestic animals of all countries in the world, but this nation contains some of the best ani-

mals with respect to breeding and quality. Winners at the livestock shows of the United States probably would win prizes in any show ring in the world. It is gratifying also to know that the average quality of livestock in the United States is improving, due to the skill of stock owners and the increasing use of purebred sires.

This progress toward better stock shows the extreme importance of protecting them even more zealously by excluding animal diseases from abroad. We may call them microbian immigrants. Though microscopic in size, they would quickly make havoc, if permitted to gain entrance, among our herds and flocks. Foot-and mouth disease is perhaps the most familiar of these foreign plagues and fortunately this disease has never gained a foothold in the United States for any longer time than was necessary to stamp it out. The outbreaks which occurred in California and Texas in recent years offered unusual difficulties in their eradication, especially in the mountainous regions of California. The situation in both states is being closely watched, but eradication apparently is completed. In other words, there was no foot-and-mouth disease in the United States at the beginning of 1926 so far as the closest Federal and State investigations can determine.

Other foreign diseases of livestock are rinderpest, contagious pleuropneumonia, surra, East African Coast fever, nagana, and mal de caderas. Each of these diseases has a history that would make it a most undesirable immigrant. Even their names are unfamiliar to most residents of the United States and we are endeavoring by strict quarantine measures to prevent their entry. This work is handled by Bureau inspectors in cooperation with American consuls and collectors of customs.

Briefly, permits are refused for the importation of cattle or other ruminants and swine from countries where destructive foreign diseases exist. Animals from other designated countries are permitted to land and proceed to quarantine stations where they are held under veterinary observation for a specified period. Importations are controlled by a system of certificates from the chief government veterinary officer of the country of origin and there must also be affidavits of the seller and of the importer showing that United States requirements to avoid exposure to contagious diseases in handling and shipping have been obeyed. Appropriate tests are made for certain diseases. Regulations dealing with importations from Canada, Mexico, Central America, and the West Indies, where the serious diseases before mentioned do not exist, are more moderate.

Besides the regulations governing entry of animals into the United States there are additional restrictions covering importation of hides, skins, wool, hair, bristles, glue stock, bones, animal fertilizers, bedding, feed, and similar materials. These regulations include hay and straw used as packing for merchandise when their freedom from infection can not be established. Animal by-products are admitted subject to official disinfection and other safeguards. Hay and straw packing material, from countries where foot-and-mouth disease exists, must be disinfected before shipment or else destroyed or disinfected after its arrival in this country.

Without going into details the best estimate on total losses in the livestock industry from disease, neglect, and injuries indicates that the sum is about 200 million dollars annually. Considering our present knowledge of sanitation and diseases, this figure is unnecessarily large. Probably three-fourths of the amount stated is preventable. If this could be accomplished we would save about 150 million dollars each year. The most promising means of attaining this goal is through combined efforts of veterinarians and livestock owners. Neither can accomplish it alone, but the professional skill and training of the veterinarian, combined with the willingness of stockmen to put tested methods of disease prevention into effect, is certain to be of mutual benefit.

The Bureau of Animal Industry has been fortunate in obtaining excellent co-operation from stock owners in its field work and in its efforts to reduce the ravages of diseases both domestic and those which have temporarily gained entrance from abroad.

# Veterinary Medicine as a Life Pursuit for Young Men Today*

T. O. BOOTH, Assistant State Veterinarian of Texas

YOU GENTLEMEN are being asked and will be repeatedly asked in the next few years to give your efforts toward inducing young men (high school graduates) to take up the study of veterinary medicine as a life pursuit.

Your efforts will be rewarded only in so far as you are able to demonstrate to and convince such eligible young men of the advantages of the veterinary profession over those of the other professions and vocations, as a life pursuit.

At the present time, I dare say, you would find it extremely difficult to demonstrate many advantageous virtues in the profession which stand out prominently above those of the other professions.

We know that our profession has advanced scientifically, and that its advance is so rapid that we, at times, are hard put to keep ourselves posted upon the latest advancements. In the field of practice, though we find that we are being supplanted by outside agencies to a point where it hurts.

The majority of us have been timid in putting forth our thoughts before our brother veterinarians for fear of being classed as disgruntled individuals and knockers of the profession.

We who were in the Army learned that the thing most important to the commanding general was his "Estimate of the Situation." In this estimate of the situation were included all the facts both of his own command and those of the enemy. With all of these facts at hand he was able to estimate quite accurately those moves and executions possible for him to carry out successfully as well as anticipate any move on the part of the enemy.

Such is the need of the veterinary profession today. An accurate estimate of the situation as concerns the fundamental principles of the existence of the profession and the formulating of intelligent plans to be executed for the advancement and furtherance of the profession.

The practice of veterinary medicine is a purely commercial proposition, and the sooner the members of the profession realize this fact the easier will be their progress. There is absolutely no difference between a livestock owner calling a veterinarian to treat a sick animal or protect such animal from a disease which threatens to be a total loss (by death) or a depreciation in value (by injury or inability to work or produce) than it is for him to call a mechanic to repair a motor or adjust a piece of machinery. The principle is the same and always will be. Please bear this in mind that if by a professional act of yours, in any branch of the profession, you have not increased the financial status of your client or the public at large or protected the public health, you have not done that thing for which you were employed.

The veterinary profession is one of the smallest in the number of members, yet, we find the members aligned against each other whereas by all cosmic laws they should be united as one. We find members and even leaders of the profession who practice, knowingly, and advocate practices harmful to the profession, for purely personal gain. An ideal state is rarely if ever obtained but is nevertheless desirable.

The profession has but few supporters or true friends who have the propagation of the profession at heart. The largest mass of people do not know what a veterinarian is or that he is in the least essential to their existence or that he is concerned in their financial welfare by making it possible to obtain cheaper food and raiment.

The livestock owner has use for the vet-

*Presented at Texas State Veterinary Medical Association meeting, Jan. 20, 1926.

erinarian only in so far as he can be benefited financially by his activities and in these times he is often misled in his estimation of lay versus professional services.

It is in the class of livestock owners though, that the profession has the most supporters.

The drug and biological manufacturers, with but few exceptions, in their eagerness to increase their financial gain, promote their products to livestock owners, through advertising, instilling into the minds of the livestock owners a sense of false security in that they are led to believe that they can, by using such drugs or biologics, obtain the same results as a professional veterinarian, considering the veterinarian only in so far as he is a financial gain to such manufacturing enterprise.

In the agricultural educational institutions and federal subsidized agricultural experiment stations the veterinary profession is only tolerated. Their efforts are confined to an attempt to incorporate veterinary science with the business of agriculture without regard to the future of the veterinary profession as such. It is in these institutions that we find the most direct antagonism, purely mercenary in character in many instances. In a textbook on agriculture written by O. H. Benson, Agriculturist of the U. S. Department of Agriculture, and G. H. Betts, author of "Mind and its Education," General Edition, a book widely used in public and primary agricultural schools throughout the United States, the word "veterinarian" does not occur, but on page 481 under the title "The County Agricultural Agent," the following statement does occur: "Like the physician and surgeon, the county agents are to be called when advice, treatment or preventative measures are needed. If a herd is stricken with tuberculosis, the hogs with cholera, the cotton field with boll worm, or the corn with cut worms, the county agent should be notified and his help secured."

In Technical Bulletin No. 27 of the Experiment Station of the North Carolina Agricultural College, under the title "Introduction" the following statement occurs: "Thorough training of the county agents and agricultural high school teachers in the prevention and diagnosis of poultry diseases, and a co-ordination of the extension and experiment station activities should be helpful in reducing the high mortality rate that is found in the poultry industry today." No mention is made of the veterinary profession or the possibility of help from veterinary sources. Scientific bulletins, pamphlets, etc., on the diseases of animals are distributed from these institutions to livestock owners, gratis, in their endeavor to further the institutions' popularity with the citizens and enable them to obtain more favorable consideration of large appropriations from the political units of government. I have yet to see a bulletin or writing of any kind from one of these institutions which stated to the livestock owner that the veterinary profession was an asset to them.

The manufacturers and selling agencies of motorized equipment are indirectly antagonistic in that they advocate the use of motor equipment in agriculture beyond the bounds of sane economics of agricultural practices.

The medical profession is antagonistic through fear of encroachment on their profession and their desire to extend their professional boundaries into fields such as dairy and meat inspection. They discredit our profession and throw laymen into the openings to block the entry of the veterinarian.

We find opposition in every allied and unallied vocation to our profession. Are we to be surprised and appalled at this display of opposition and antagonism? No! We should expect and anticipate it and marshall our forces to stay the tide and sweep on into the enemies' territory to new and better things.

We are only experiencing the age-long law "the survival of the fittest." If we hang our heads and turn aside at the feel of opposition we shall surely die. We have in the past confined our efforts to the scientific side of our profession thinking little of the wolves lurking in the shadowed future. One thing we do know is that veterinary science is essential to world progress. Elim-

inate it and the progress of the world would cease and retrogression would quicken the world into oblivion, through the ravages of animal diseases. Judging man's intellect we cannot but surmise that the science will not be lost. The question arises, will veterinary science be absorbed into that of an allied profession or will the profession as it now exists be able to retain this science? It is clear that the present attitude of the educational world to educate the layman in the science is going to create a semi-professional group that is going to practically eliminate the veterinary practitioner, and as time goes on these will also invade the other fields of the profession, pushing out the man educated in veterinary science only. It is noticeable at this time that some of the state agricultural colleges are taking into their faculties young men immediately upon their graduation from veterinary college. It is not for the experience they possess in the practice of the profession. No, it is to train them in the system of teaching of veterinary science as they see the time not in the far future when trained veterinarians will not be available to teach the science in their colleges and they have reverted to the old custom of training lest the structures they have builded fall down.

It has been said that the profession at this time is not in a greater danger than it was in the days when the uneducated and unethical horse doctors were the foes. To take that stand is to wilfully ignore the highly educated and organized foes of today, backed by national resources.

The hand-writing is on the wall for all to read who will. There is rarely a day passes which does not reveal the writing in some manner or another.

We can lay the blame at no one's door but our own. We admire the aggressiveness of those who forge ahead and lament the fact that we are not as successful in our progress as are others, when if we were to analyze the success of others we would find that they had been raised to that eminence by united effort and spirited on by the applause always given to those who are outwardly successful.

The profession needs to realize that inactivity will cause atrophy of an organization as well as of a tissue. Organized activities are our hope. Every veterinarian in the profession should finish a course in salesmanship and apply those principles to the daily practice of his profession. Our organizations should adopt those principles and sell the profession. The psychology of the human mind today requires that it be sold a proposition before it will adopt it and it not only requires it to be sold on a proposition once but it must be sold repeatedly. We must outline a plan of sales promotion which will be perpetual and we must freely give our efforts and money to enable it to be carried out successfully. Nothing lasting or worth while is gained without effort. Other professions and vocations are selling their propositions and are reaping the rewards thereof. Let us arouse out of our hibernating state, get into action, lest we awake in the future and find that we are too late and our profession vanished. A fighting spirit is what we need. Fight for those things which are rightfully ours, demand them and get them, by force if necessary. Don't let some outsider come in and steal the money out of your pocket while you look on. Scream at least, any woman would do that.

Let us reiterate our ideal: We pledge ourselves, individually and collectively, to enable the livestock industry to produce better livestock, more economically, and to lessen the ultimate cost of such food and raiment, to the consuming public at large. We further pledge ourselves to protect the public from the ravages of disease of animal origin and to aid to the best of our ability in the promotion of the welfare and happiness of everyone.

Knowing the strength and attitude of our enemies, are we fully prepared to capture our goal and hold it against siege? Would it not be wise, in view of the aggressiveness of the enemy in certain sectors, to more firmly entrench ourselves in order to enable us to hold the ground we now have? Our first act in this entrenchment should be the marshalling of our man-power into a common workable unit. Keep a membership in

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your national and local veterinary organizations and take an active part in their activities. They are your units of force and strength.

With what can we expect to hold the prestige we now have? The answer is publicity. Every state veterinary association should have an active publicity agent—an agent responsible for the dissemination of the publicity matter into proper channels, and not an inactive committee whose members each expect the other to do something and in consequence of which nothing is accomplished. Each individual member should aid and assist the agent in every way possible and see that he is active and not a drone. The national association should become active in publicity, more so than it has in the past. We should watch the instruction in our public schools and see that the veterinary profession receives the publicity it deserves along with that of the other professions. There isn't a veterinarian as a member of the House of Representatives or the State Senate of the State of Texas. There isn't a veterinarian in the House or Senate at Washington to protect the interests of the profession in that body. Do we not have as good material as is represented in those bodies today? You members of educational faculties and other institutions proclaim yourselves as veterinarians and not as poultry instructors or what not. Give the veterinary profession that mothered you the credit she deserves. Do not unthinkingly give such credit to some other profession.

Let us increase the effectiveness of our man-power by more thoroughly educating ourselves and keeping up to date with the advances of veterinary science. Let us take the responsibility of the education of veterinary students and not delegate such responsibility to the laity who are concerned with other lines of education..

The veterinary profession should provide an endowed veterinary college and experiment station, under the supervision of the American Veterinary Medical Association, at which to teach at least, the last two years of an approved course in veterinary science. Marshal together the best veterinary talent possible to be obtained, at this college; relieve the burden now placed upon the state colleges and control the dissemination of our science; provide for the students of our profession a place at which to obtain a standard veterinary education and provide for the profession a center of research and investigation. As the educational situation now stands, and no disrespect is intended to the veterinary members of the faculties, our colleges of veterinary medicine are divided into small bodies, a few good men here and a few good men there, whereas by concentration we could have the best in all the branches under one roof. Such a college would not only lessen the cost of educating a veterinarian but would enable a student to obtain a better education than is now possible and give the profession the prestige it deserves.

Let us not be content with holding what we now have, but rather let us put up an aggressive fight to regain that which we have had and lost and to enter new and heretofore forbidden fields.

The ideal ground upon which to fight a battle is upon the enemy's territory. You do not devastate your own territory and your damage as well as that of the enemy is confined to the enemy's territory. The county agent has fought in the past and is still fighting the veterinarian upon veterinary territory, devastating it in places. Let us carry the fight into the enemies' territory. Every county in the United States should have a county veterinarian, paid by local and national governments. Statistics show us that on the average farm in the United States, of the revenue obtained from farming activities, from 50% to 95% is obtained from the livestock industry. Is not a veterinarian more needed by the farming interests than the county agent whose primary business is agricultural per se? If the need were not apparent why should the county agent be endeavoring to render this service for which he is not trained? The county agent has had the field for the past eight or ten years and has failed in his efforts to combat diseases of animals. During this time veterinary activities have materially decreased and the diseases of livestock have

increased over 100% as shown by the U. S. Department of Agriculture report of 1924. They are realizing that they are not prepared to cope with this situation and are endeavoring to stay their retreat by increasing their activities and education in veterinary science. A united effort upon our part will convince the agricultural and political interests that the veterinary profession is of more value to their interests than is the county agent, in protecting their livestock from disease, a service which is from fifty to ninety-five per cent more valuable than that given by the county agent.

Induce your livestock clients to keep cost records of their power operations and compare the mechanical with the animal power results in dollars and cents over a course of years and show which is the more economical. Be active in the livestock organizations and protect their interests. They are your friends.

Every state in the Union should have a statute law creating a State Meat and Dairy Inspection Department, manned by veterinarians. There is dire need of such a service to protect the public health. Other interests are attempting this work but through lack of knowledge and experience the situation is becoming pitiful in some sections.

There is a need of these things, gentlemen, and this need is being recognized by some of the brighter minds in the agricultural world today. They are asking that the veterinarians come in and take over the responsibility of these problems and work them out to the final benefit of both the livestock and veterinary interests. They are yours for the taking and you can keep them if you fight for them, but you can not expect either to receive or hold them if you do not get your fighting forces into action and fight with all your resources for these things which are rightfully yours and which the world wants you to have provided you have the backbone and stamina to take them away from your enemies and protect them against attack..

Our profession has before it a wonderful future; it is brimming full with potentialities for good of the human race. We need young men, with a fighting spirit, to carry on after we are gone and assist us in the battles we have now before us. Let us guarantee to them with actions that we will protect them as veterinarians and we will have no difficulty in proving to them that the veterinary profession has greater possibilities in return for effort expended than the other professions and vocations. They will find the profession interesting, worthy and acceptable.

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## THE AIREDALE AS A NEW SHEPHERD DOG

The stockmen in the West who are raising goats, the wonderful, white, silky-haired Angoras, have found the Airedale dog of great assistance in caring for the herds. The prowess of the old shepherd dog has been known throughout the centuries, but the Airedale goes them one step better.

When a female dog has a litter of pups, the strongest of the litter is taken away from her and given to a recently fresh nanny-goat, whose kid has been shut away from her.

The blind puppy does not seem to know the difference and the uncomfortable nanny is glad to be relieved of the milk that has accumulated, so allows the little thing to suckle her.

At first the goat and the puppy are enclosed in a pen, then allowed to roam about a small lot until the wobbly legs of the puppy can stand trips afield. When it can do this it trots contentedly along beside the only mother it knows. As the months roll along it becomes strong and fearless and what is known as a killer. It will not hesitate to attack any prowling animal that might be dangerous to the flock. It has adopted them and will protect them.

Such a dog will lie in the corral at night with the flock and will come only occasionally to the house. It will forage for itself. Any meat that is given should be fed in the corral, but that will be necessary only during cold weather, in the absence of rabbits, birds, etc.

Such a dog pays for itself many times over in faithful service.—M. S. Welch in The Dog Fancier.

# Veterinary Dentistry

S. E. HERSHEY, Charleston, W. Va.

THIS SUBJECT for some reason for many years was very much neglected and hooted at by many of the leading veterinarians, and in fact the veterinary colleges gave but little attention to it until about twenty or thirty years ago. The groom and stable man, blacksmith, locksmith or cross-road storekeeper with his steady punch and hammer or mallet and pair of tongs, was looked upon as the scientific dentist or tooth-puller, as he was called in those days.

I think the McPherson and the Lucas veterinary schools located at Toronto, Canada, were the first to give a course of instruction in veterinary dentistry. There may have been a school that sprang up in Chicago and also in New York that gave attention to the subject, but of these I am not so sure. They were held in disrepute by the leading veterinary colleges at that time and condemned, but they, to my mind, did a great deal of good, for their work and instructions were on very practical lines.

Courses in dentistry were later added to the curriculum of the other veterinary schools. I am very much inclined to think that one of the prime factors leading to these added courses at the colleges was the death of Joe Pachen, a horse that literally starved to death because of a bad tooth. He was treated in the state of California by the best veterinarians there. He was then sent by express to New York City, and there the leading veterinarians were called to prescribe. He received treatment in the way of tonics and everything imaginable to build up an emaciated condition but all to no avail, and he practically starved to death on a Long Island farm. After decomposition of the soft structures of his head, the actual and true cause of death became visible. Photographs showed the fourth upper molar was one and one-half inches longer than normal, and the lower molar opposing it was entirely worn away, nothing being present but the old decayed root in the dental alveoli with a carious condition at the root. This condition is only one of the many hundreds that have caused veterinary dentistry to develop as it has. This horse, no doubt, could have been saved many months and years of torture if his mouth had been examined thoroughly, and very likely he would have rendered many more years of usefulness.

I think there is more trouble with young colts and puppies shedding their milk teeth than in older animals with their permanent teeth. At this age in the young, there is a great deal of stomatitis, lacerated tongues and cheeks due to the sharp edges cutting them. Watery eyes and ptyalism are also found in colts and horses while shedding their teeth. In puppies and cows there is sore mouth with much congestion of the mucous membrane followed by convulsions and an irritated mental condition, in dealing with which one must be very careful and very conservative in diagnosis, particularly in the dog, for many times at this stage the animal shows symptoms somewhat similar to those of rabies, nipping and biting, and no doubt many puppies have been killed in this condition by those who mistook it for rabies. If such animals had been kept in quarantine for a few days and history of the cases obtained, many valuable lives could have been saved, for as soon as these caps or milk teeth were shed and the permanent teeth erupted, this mental condition would have abated.

The hard structure of the teeth consists of, first, the enamel; second, the crusta petrosa or cement; and third, the dentine. The soft structure consists only of the pulp.

The division of the tooth is as follows: first, the crown; second, the neck; third, the fang; fourth, the root; fifth the table surface; sixth, the infundibulum; and seventh, the cup.

In the horse there is one tooth which all no doubt have heard of and one that has caused more pain and torture than any other tooth known. This tooth seems to be the cause of all ailments to which horse flesh is heir—moon blindness, weak eyes and many other ailments have been attributed to the little old wolf tooth. The so-called scientific dentist of his day, the blacksmith, with his punch and hammer in attempting to knock out these teeth could only break them off and leave the roots still in the jaw, which would be the actual cause of trouble, if they were the cause of the supposed ailments. In many cases, the punch was allowed to slip and in so doing the enamel was broken on the first molar causing it to decay and finally call for extraction.

Another condition about which one will be asked, regarding which I am sorry I can offer no enlightenment, is the black teeth of hogs. This like many other old traditions has been handed down from generation to generation, and I am sorry to say it still exists in many localities at this stage of civilization. Like hollow horn and wolf in the tail of cattle, the mystery of black teeth in hogs perhaps will never be overcome.

Malformed or misplaced teeth occur where the dental cells have located in their embryonic form in various places such as the parotid gland and sometimes in the testicles and scrotum. At times they cause fistulous tracts to form, in which case their removal by surgical operation is indicated, using the same technic as in fistula elsewhere. They are sometimes found lying perpendicular with the permanent molars and incisors or in the different sinuses of the head, where they may remain for years without causing any trouble. In such cases, it is best to leave well enough alone. But if they cause any trouble such as ulcerations, nasal catarrh or fistula, their removal by trephining or expulsion is followed by speedy recovery.

Odontomata are due no doubt to some perversion of the fetal evolution. Abolition is advised when there is interference with the normal functions of the nasal chambers, by trephining or the bone chisel as advised in extraction of the molars.

Supernumerary teeth refer to an extra number either of the incisors or the molars and may be either a double row or an extra tooth inside or outside of the natural row. They as a general rule can be extracted without much trouble, but as long as they cause no interference with the normal conditions, it is advisable to leave them alone.

Among malformations of the mouth, there is first, brachygnathia or parrot mouth, where the upper jaw is longer than the lower. Then, we have the opposite, prognathism, the under jaw being longer than the upper. In these two conditions, we occasionally find in horses that are grazing difficulty in prehension of the food, and consequently they may not be able to keep in good flesh. However, one may be very much surprised to see how some horses and mules in this condition are able to use the dental pad as a substitute for the teeth. As the molars are usually good, the animals can properly masticate their food and keep in good flesh. Then there is the scissor mouth, where the molar teeth do not wear due to the irregularity of the outer edge of the upper teeth and the inner edge of the lower teeth growing excessively long, allowing these edges to become excessively long and sharp, thus the outer edge of the upper teeth cutting the cheek and the inner edge of the lower cutting and lacerating the tongue. This is due to the lower jaw being so much narrower than the upper. The condition may be corrected to a great extent by the use of the cutters and the float. But a word of caution here—be very careful in the use of the cutters and the float in correcting this as well as minor irregularities of the same nature, for we must remember that the table surface of the grinders or molar teeth is slanting, and if we take too much off these edges, there is likely to result a flat surface, and then the horse will not be able to hold grain between the teeth and cheeks while mastication is going on. I have seen this occur in a number of cases where the power float has been in use and the operator doing the work not knowing the natural condition of the teeth. I think this is one of

the things that has brought veterinary dentistry into disrepute in many localities.

An examination of the teeth as to soundness reveals many irregularities, of much importance to the veterinarian, for by this method he must decide the age of the animal—horses, mules, cattle, sheep and dogs. Possibly in the horse there is more deception than in any of the others. For in horses there is practiced what is termed bishoping —the drilling of the table surface of the teeth of the aged animal, then filling the cavities with nitric acid or burning them with the hot iron, thus making a dark cup to deceive the unsuspecting. This, of course, is done only after the natural cups have disappeared. The veterinarian, knowing the conformation and the angle of the incisors in the jaw, together with decayed, worn molars, can readily discover the irregularity.

In trephining a molar tooth affected with an abscess at its root, first place the animal in a standing stall by backing him in; then place a dental halter with two straps fastened to each side of the stall, placing a surcingle around the body and fastening a strap from the halter to the surcingle as a martingale. Now, the horse's head is restrained. He can neither turn to the right nor the left nor raise his head. A twitch may be used in some cases if necessary. Next a speculum is placed on the horse. With one hand in the mouth and the other on the outside and over the region of the tooth, it can be located and its general direction followed as a landmark. After this has been done and the angle of the tooth located, with a sharp scalpel make a cut at right angles over the location of the root, laying back the four lips of the wound, then inserting the trephine and drilling through into the sinus. I should have said that the field of operation should be thoroughly cleansed and disinfected by clipping the hair, washing, drying and then painting with tincture of iodin before the operation is begun. The trephine used in this case should be ¾ to ⅞, or even 1 inch is not too large in some cases. Then with the punch on the root of the tooth through the trephined opening and one hand in the mouth on the crown of the tooth, with a firm stiff stroke with the mallet or the hammer, the molar should be loosened sufficiently to be removed with the forceps or in some cases can be lifted out with the fingers. The wound is then cleansed and kept clean and if so will heal in from two to four weeks. Sometimes it is advisable to pack the cavity with a gutta percha plug, which must be placed in position while it is quite warm so that it will take on the general shape of the cavity it is being placed into. The trephined opening must not be allowed to close too soon. Sometimes in highly bred and nervous horses, a general anesthetic will have to be used.

A condition in horses that we must not confuse with diseases of the teeth is osteoporosis, commonly termed big head or osteomyelitis, a softening of the bone. The same applies to glanders in horses and actinomycosis in the cow. It is true that there may be loosening of the teeth in either of these conditions and due to them. In dogs and cats we often find foreign bodies, fish bones or small chicken bones, lodged between the teeth. These can as a rule be removed by placing a speculum on the animal and using the ordinary splinter or dressing forceps. In the horse and cow, sometimes corn-cobs, nails or pieces of metal of different kinds lodge between the teeth, or the animals may bite on a hard substance and break or split a tooth, which calls for extraction.

Among vices and habits caused by the teeth may be mentioned cribbing or wind sucking. Here again is a condition that in examination for soundness may try the veterinarian's skill. But by close attention and observation, the anterior borders of the central and middle incisors will show where they have been broken or worn off by taking hold of the manger, fence or any hard surface. An operation of sawing between the central incisors is said by many to cure the vice. Another operation for this condition is myotomy of the sterno-maxillary muscle in the upper third cervical region. But neither of these operations have proved satisfactory in all cases. The only method that has been satisfactory is where a strap, 1½ to 2 inches broad, has been kept buckled

around the neck of the horse at the throat latch. This will prevent the animal from taking hold while he is wearing the strap, and then he is placed in a stall where he has no possible chance to get hold of the manger or rack. Even this method, after horses have been submitted to it for years, has failed to effect a permanent cure.

Habitual ptyalism, continuous slobbering due to the irregularities already mentioned, side reining, pulling on one side or another, caused by sharp and irregular teeth, may be corrected by floating. Other conditions are habitual tongue lolling, bit lugging, facial paralysis, sometimes called Bell's paralysis, due to paralysis of the seventh cranial nerve, and a partial or complete unilateral molar paralysis.

A veterinarian cannot use too much care in his examination of the mouth and teeth of all animals, their physiological functions relative to the health of the patient and their pathlogical conditions caused by the different irregularities and accidents mentioned. In this article are noted a few of the many conditions that the practitioner is called upon to consider and pass his opinion on. I have said nothing as to the cups changing in the dental development of the incisor teeth or their conformation according to age. This in itself would require a great deal more time and a more lengthy paper to go into details.

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# Rabies and Its Control*

C. R. WALTER, Tulsa, Okla.

RABIES IS AN ACUTE infectious disease affecting the canine race, but is readily transmitted from animal to animal and from animal to man by the bite of a rabid individual or by direct contact.

All warm blooded animals seem to be susceptible, and its persistence among dogs and the common transmission from dogs to other animals are due to the tendency of the dog to bite, his desire to be sociable and his habit of roaming at large over the country. A rabid dog appears to have a morbid desire to attack others of his own kind and next to that is his desire to attack whatever is most easily accessible or comes in his path, such as grazing animals or the unsuspecting person who attracts his attention.

Rabies was known and described for centuries before the Christian era, and from earliest times has caused fear and dread upon its appearance in a community. Aristotle wrote: "Dogs suffer from a madness that puts them in a state of fury, and all the animals that they bite when in this condition become also attacked by madness."

Periods of the transmission of the disease by wolves occurred in 1591. It was prevalent among the foxes in Europe early in the 19th century. Soon after this the disease spread all over Europe and caused heavy losses in America. The first appearance of the disease in America was reported in Boston in 1768. In 1770, it was observed in dogs and foxes near Boston. In 1779, it appeared in Maryland and Pennsylvania, and ten years later it was prevalent throughout the northern and southern states.

The terrible manifestations which have always surrounded the disease have been the cause of endless fallacies and misconceptions and it was not until within the last half century that much of the doubt was eliminated by scientific effort. Too much praise and credit cannot be given to Pasteur and his co-workers for our present knowledge of the subject. At present the disease is widespread appearing in nearly every country on the globe.

There are few diseases that have caused more controversy than rabies. Some medi-

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cal men even to this day and age deny the existence of the disease or declare it of spontaneous origin from imagination or from overwrought nerves. Hence, it is almost impossible to accurately determine the spread of the disease.

Sometime in the past it was supposed that the saliva of rabid animals was not virulent until after the appearance of the symptoms of the disease. However, experiments show it is virulent 6 to 8 days before symptoms appear. If an animal remains healthy for 10 to 12 days after the person has been bitten, there is no danger from rabies even if the animal should develop the disease.

There is a popular belief among the laity that dogs go mad only during dog days in July and August. The name "dog days" is given to that time of year because the dog star "Sirius" is above the horizon with the sun.

### Morbid Anatomy

One of the most striking features of the disease is the absence of recognizable lesions. In some cases especially in dogs, the spleen is enlarged and blackened, tongue and pharynx congested, and the stomach often contains much foreign matter. These are, however, not constant in other animals. In some cases the brain is highly congested, in others it appears normal.

The disease is transmitted by a virus that is contained in the saliva of the infected animal. It has been shown that this virus is also present in the salivary glands, especially the sub-maxillary glands and in the central nervous system. The virus has been studied by a great number of scientists, and Pasteur developed the method of protective inoculation before much was known about the virus.

This is a filtrable virus. Further, some of the viruses, when transmitted from the animal in which they commonly occur, to another animal and carried through a number of passages in the animal will not produce disease when injected back into the animal from which they came, but produce immunity to infection in the natural way. This last characteristic of the rabies virus gives the name of "street virus" and "fixed virus" as used by Pasteur. Pasteur used the term "street virus" to designate the rabies virus that is transmitted under natural conditions from dog to dog, from dog to man, or from dog to some other animal. When this street virus is inoculated into rabbits, and it is carried from rabbit to rabbit by subdural injection of material from the central nervous system, the virulency of the virus for the rabbit gradually increases, and the incubation time becomes shorter and finally becomes very nearly constant. This "street virus" injected subdurally into a rabbit will kill the rabbit in about 18 days: as the virus from the rabbit is injected into another rabbit, and so on, the incubation time gradually shortens, until the rabbit develops rabies regularly in 8 days. This shortening of the incubation period means that the fixed virus produces a stronger toxin than does the "street virus"; and in keeping with this, the central nervous system becomes infected in less time after inoculation with "fixed virus" than after "street virus," indicating higher virulency in the "fixed virus." For us the great advantage of the "fixed virus" is that when injected subcutaneously it is not infectious for man, and it is far less infectious than "street virus" for dogs, monkeys and other animals; and when so injected, it produces immunity against infection with "street virus."

In 1903 Negri discovered, in the pyramidal cells in the central nervous system, the bodies that bear his name.

Using the single injection vaccination method on a great number of dogs as we do in Tulsa, we have had in not a few cases, swellings at the point of injection and in a very few abscess formation. In seven cases with abscess formation, we have had one case of known rabies and six cases of pseudo-rabies or cases resembling infectious bulbar paralysis, from 10 to 14 days after vaccination.

A Fox Terrier belonging to the hospital was vaccinated April 20th of last year; first symptoms noticed on May 4th, and died on May 14th. An Airedale was vaccinated on the same date as the Fox Terrier; first

symptoms appeared on May 8th, and the dog died on May 18th. Another dog was killed before the outcome of the case could be determined. Four cases recovered.

**Symptoms**

Swelling, inflammation and later necrosis at the point of infection, which the animal bites and scratches from the intense irritation, often to the extent of bodily mutilation. The temperature is at first normal, later subnormal. We have a sudden change in disposition, the animal having a tendency to seek cool dark places. The skin is very sensitive and the animal will cry out with pain when touched or handled. Vomiting is persistent with loss of appetite. The muscles around the face show marked twitching which is at times periodical or constant. We have increased reflex excitability of the nervous system, with increased muscular sensitiveness. Marked dyspnea, and toward the end the subnormal temperature is very marked.

Brumley gives the period of incubation as 2 to 9 days. We have had no cases show symptoms until the 14th day or after.

Autopsies were held on the Fox Terrier and Airedale without marked lesions being found. The cord and brain were removed from the Fox Terrier, sectioned and stained, when a great amount of Negri bodies were found, showing true rabies. The Airedale was likewise examined, but no Negri bodies found. Experimental inoculations with nerve substance into rabbits were found negative.

**Control**

Muzzling, tying or confining dogs in a pen is not taken to kindly by the public. An ordinance or law of this kind is very difficult to enforce as people think they may torture their pets and some really think their dogs are too good to take rabies, no matter if they are exposed. The latest and best means of control is vaccination by the single injection method. We have been successful in having an ordinance of this kind passed in Tulsa, last October, which provides that all dogs within the corporate limits of the city must, after the 1st day of January, 1926, be vaccinated by the single dose method before a city license will be issued. The ordinance also provides for a fine and jail sentence for those who refuse or fail to have their dogs vaccinated on or before Feb. 1, 1926.

In order to get this ordinance passed, it was necessary for the veterinarian to reduce the fee from $2.00 to $1.50 and the city likewise reduced the price of the license fee one-half. Now the dog owner can have his dog vaccinated with license included for the same price as the license was issued for last year, and in case of female dogs it is 50 cents cheaper. This may leave the impression that we in Tulsa are belittling the profession by doing work for such a cheap fee. But I am still of the opinion that we should look at this matter more from a standpoint of protection of the public health than from a financial point of view. As soon as the public know we are doing all in our power to cooperate with them on questions where the public health is involved, just that soon will they have more confidence in us and give us their hearty cooperation and support.

One of the greatest factors to elevate our professional standing, one which would give more public confidence, would be to emulate more and more the system of the M. D.'s who are always willing to give of their time and efforts on all matters where their services are of great interest to the public at large. Personal gain should not take supremacy over professional ambition, and all pleas for public favors must not be tarnished with selfishness.

**Legislation**

Several times in the past and especially last year our legislative committee has been instructed by this association to go before the meeting of the legislature and ask for this or that favor, only to be unsuccessful. I am of the opinion the more this association will remain out of the limelight when such favors are asked, the more chance we will have in having them granted. I have in mind at this time, state-wide vaccination of dogs against rabies. At the meeting of our last legislature the state chapter of the Izaac Walton League came forth with four or five favors and all were granted. Why?

Because public sentiment was with them, their causes being for the public good. I would suggest, if this state law is wanted by this Association, that every member of this Association join his local chapter of this League, then talk this proposition over with the individual members and get up and talk it at the meetings. I am sure this law can be passed by cooperating with this organization.

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# Infant Mortality in Swine—Cause and Prevention*

A. T. KINSLEY

## Proper Feeds and Feeding Prevent Pig Losses

THE FEEDING OF BREEDING swine is a problem that is difficult to discuss in generalities because of the fact that the food stuff that may be available on an Illinois farm for feeding of swine can not be profitably used on a farm in Florida, Montana or Arizona. We believe that veterinarians will find it profitable to study the problem of feeds and feeding of swine in their respective communities. If veterinarians can intelligently discuss the problem of feeds and feeding with swine raisers and can impart information that will be of monetary value to the man who is producing pork and pork products, they are serving an important purpose in their communities.

A food may be defined as any substance which may serve nutrient purposes. The type and amount of foods required depend upon the amount of waste, whether or not the animal is growing or fattening, and the nature and amount of exercise. The primary object of feeding swine is for development and fattening. The discussion which follows will be confined primarily to the feeding of breeding swine.

Some experiments have been conducted to determine the relationship and importance of nitrogen, phosphorus, ash and other ingredients in growing pigs. Generally speaking, it has been found that from one-half to one pound of protein should be consumed daily per 100 lb. live weight of the pig. The total phosphorus in the body of ten months old pigs is distributed approximately as follows: 4/5 in the skeleton, 1/9 in the meat of the carcasses, 1/20 in the blood and other structures, excepting the fat and there is a trace also in the fat. The amount of phosphorus increases about 50% in the skeleton from the time the pig is four or five months of age until it is ten months of age. The amount of phosphorus stored in the body during the growth is approximately one-fourth the total quantity consumed during the same period of time. The total ash in the body of a ten months old pig is distributed approximately as follows: 4/5 in the skeleton, 1/9 in the lean meat; 1/6 in the blood and other organs and the fat. As a pig becomes older the ratio of total ash in lean meat to the total ash in the skeleton decreases.

The quantity of carbohydrates and fats required depends upon the age and purpose of the animal. In addition to protein, carbohydrates and fats a certain amount of mineral elements is essential. It has been found that mineral matters are of special importance in the development of breeding swine. Calcium phosphate supplies the demands required in the usual developing pig and should be provided. Failure of properly balancing a ration results in malnutrition, dietary disturbances, or other conditions, thus resulting in economic loss to the swine breeder. It should be understood that the same pig under different conditions will require distinctly different quantities of the same combinations of feeds, in order that it be properly maintained or developed. The hog can utilize the majority of waste products of a farm more economically than any

* Continued from February issue.

other animal, but it is equally a fact that swine are not merely scavengers, they require a properly balanced ration.

Diet depends upon the type of animal and its use. Mother's milk is the natural diet for the new-born. Sows, no doubt, differ in the quantity of milk produced, as well as the quality of the same similar to cows. It has been found that some sows produce from 5 to 7 lbs. of milk per day for a period of from 8 to 12 weeks. The analysis of sow's milk in a limited number of cases has shown that it contains approximately 7% of butterfat, 6% of casein and albumin, 5% to 6% of sugar and 1% of ash, or total solids of over 19%; thus sows' milk contains approximately 50% more total solids than cows' milk. The fat globules of sows' milk are only one-fourth as large as those of cows' milk. From a few experiments it has been found that some sows rank favorably with good dairy cows in their ability to convert food stuffs into milk. The size of the fat globules is an important factor in the digestibility of butterfat or milk. Many orphan pigs that are fed upon cows' milk die of digestive derangement, because of the difference in the digestibility of sows' and cows' milk, due to the difference in size of the fat globules. A prepared milk approximating the composition of sows' milk may be made by the addition of cream, milk, sugar and lime water, and will be found quite useful as an additional food to sows' milk or to replace sows' milk in the case of orphan pigs.

The economical diet for pigs after weaning and until they are to be used for breeding, will vary according to location. The important factor is to maintain the pigs in a thrifty condition and favor the limit of development in size in a reasonable length of time. Pigs are developed most profitably in practically every section of the United States by pasturing. There are possibly certain exceptions at least according to the agricultural methods now in vogue in restricted areas such as the wheat growing district of Washington and some fruit areas in various states, in which it is claimed that it is more profitable to use the land for other than pasture purposes for swine.

It is more profitable to feed small quantities of corn, barley, or other foods to pigs that are on pasture because it favors growth and hastens development. The various types of forage for swine pasture vary in different locations. Alfalfa, clover, blue grass, peas, soy beans, rape and a variety of other grasses and forage are successfully used. The grain or concentrates for swine on pasture should be so selected that the ration supplied is best suited for growth and development. Corn and barley balance the ration for pigs on clover, alfalfa and other legumes. These concentrates can be varied in quantity if tankage and milk products are used. Generally speaking, tankage or some similar food is especially valuable and it will be found that pigs on pasture that have access to tankage rarely root, indicating the tankage is supplying some required ingredient in the food regimen.

According to some investigations, the diet should be slightly different for pigs that are going to be used for breeding and those for fattening, from the time of weaning. The breeding pig should be given about one-half pound of protein or less per hundred live weight, and fattening pigs should be given 3/5 to 4/5 pound of protein per hundred pound live weight.

For breeding sows a maintenance ration should be provided. Pasturing will be found economical for breeding sows and boars when not in service. Varying quantities of concentrates should be provided, using small amounts of grain until the later stages of pregnancy when the feeds should be changed so that there will be a limited amount of fat-building elements and an extra quantity of nitrogenous and milk producing foods. The diet should be diminished a week or ten days prior to farrowing.

Feed should be withheld for 24 to 48 hours after farrowing excepting those sows that are excitable and can be quieted by small quantities of liquid or semi-liquid feed. The sows' diet should be so regulated that they will produce only a moderate quantity of milk for at least ten days after farrowing, after which the diet should be increased in order that the maximum quantity of milk will be produced. Failure to regulate the

sows' diet as above outlined is one of the principal causes of scour in pigs, a malady that is annually exacting a toll of over five million pigs.

Preparation of food stuff is important and is worthy of due consideration by all concerned in the swine industry. The grinding of corn effects a saving sufficient to pay for more than the cost of grinding. Cooking is of no value for grain foods. It is of value in garbage feeds and it may possibly be profitable to cook potatoes and related foods. The soaking of feeds is of little or no economic value. Possibly soaking may in some instances stimulate the appetite, but in more cases the soaking is not properly done and the foods are fermented and soured and thus result in more or less digestive disturbances. The method of feeding is also an important consideration in the production of swine. From various tests that have been conducted in practically all sections of the United States, there is no reason to doubt the efficacy of self feeders. It should not be construed that self feeders eliminate the necessity of labor; however, they do diminish the amount of labor necessary in caring for swine. The type of self feeder selected will depend upon circumstances and upon the personal desire of the feeder.

The feeder that provides the proper ration for developing or fattening of swine has the fundamental principle for success in the swine industry. Veterinarians should be familiar with the feeds and the food requirements of swine. The value of mineral foods is now recognized by most men interested in the swine industry and most veterinarians appreciate the significance of minerals in the preparation of a ration for swine. The preparation and methods of feeding are individual problems on each farm and the most successful veterinarians are helping the hog raiser to solve those problems.

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# Poisonous Plants

**L. H. PAMMEL, Dept. of Botany, Iowa State College**

## ARE SOY BEANS POISONOUS?

Last fall Dr. C. E. Hunt of Mt. Pleasant, Iowa, sent a specimen of the woolly podded soy bean which was very moldy, with the following letter:

"I am sending you a few moldy soy beans on which I should like your opinion and advice. I have two cows that were running on a cut-over cornfield, the crop having been put in the silo, but a good part of these soy beans were left. It has been raining here for nearly a month, and I am wondering if it is cryptogamic poisoning or protein poisoning. These two cows refuse all feed, have atony both of the rumen and bowels, no rise of temperature, but are very weak and have commenced to show nervous symptoms. Our unseasonable weather here this fall has brought me several cases of cryptogamic poisoning where every case showed stomatitis and soreness of the feet, but these two cows are entirely different."

The fact that the soy beans are moldy in itself would make them unfit for feed; besides, there seems to be some record as to the fact that soy beans are more or less injurious under certain conditions. If fed rightly, they are all right, but I notice in a recent number of The Veterinary Record in a discussion of the soy bean matter that mention is made of the poisonous properties of this plant under certain conditions, W. H. Andrews, stating:

"In speaking of poisonous plants, we refer to plants which, when growing under normal conditions, are liable to contain some poisonous principle, or some substance which easily gives rise to such a principle when ingested by an animal. As far as I am aware, the soya plant has not been shown to be poisonous in this sense, but the authors have done well to refer to soya meal and cake; the intoxication associated with this product is both interesting and important, and it is of particular theoretical interest since it appears from Stockman's work that the whole

soya bean is not poisonous and that only one special form of treatment renders the products dangerous. I do not know whether any experimental study has been made of the soya plant itself, in the different stages of its growth, but such a study would certainly have much interest."

## "BROOM WEED"

Dr. E. R. Forbes of San Angelo, Texas, writes: "I enclose a query for the plant department to be answered through Veterinary Medicine. The broom weed is a plant which grows extensively on the ranges of Texas. A plant expert once stated that there are two varieties, the tall and the short, and that the short had an ecbolic action. I should like information on that point."

The plant referred to by Dr. Forbes as broom weed is not the plant which goes by that name in Europe. I think it must be one of our native American plants which is a member of the sunflower or Compositae family. The plant is related to blazing star or button snakeroot (Liatris) or gum weed (Grindelia). The latter is used in medicine. I believe I have heard the name applied to one of the species of Gutierrezia euthamiae or Gutierrezia sarothrae. This is a bushy plant, one to two feet in height with narrow leaves and yellow flowers. It is common from Texas to Montana. There are three or four other species found in Texas, as the S. sphaerocephala, a low bushy plant, G. eriocarpa, a taller plant, or the S. Texana, an annual, much branched and taller. I do not find these plants recorded as poisonous. The gum weed is a very close relative and contains a bitter alkaloid and two gluosides.

## BLACK NIGHTSHADE

A correspondent at Knoxville, Iowa, writes: "I should appreciate obtaining a description of the weed called nightshade which is classed as a poisonous plant."

The common nightshade, stubble berry or black nightshade, is an annual with low spreading branches, usually smooth, with ovate petioled leaves, white flowers in small, umbel-like, drooping clusters. The flowers resemble those of the potato except they are very much smaller. The berries are smooth, roundish, blackish. The weed is a native of Europe but is commonly naturalized in many sections of the northern United States and now is a cosmopolitan weed. It is extremely common in small grain fields after the grain is cut, and hence is frequently known as "stubble berry." There is a form, or hybrid, of this plant which is cultivated, known as "wonder berry," which is used for pies and preserves. The ripe berries of the common nightshade or stubble berry are probably not very poisonous, but the green leaves and green berries certainly are. It contains the same kind of alkaloid found in the green leaves and stems of the potato and other members of the genus Solanum. A related species, the three-flowered nightshade, which has three flowers in a cluster, is quite poisonous. This plant is common westward.

## BITTERSWEET POISONOUS

A correspondent at McGregor, Iowa, has sent in a specimen with the query as to the botanical name and if it is poisonous.

The plant sent for identification is what in the botanies is referred to as the bittersweet (Solanum dulcamara). It is not, however, the same bittersweet so common in our woods. This is Celastrus scandens. The Solanum bittersweet is native to Europe and has been widely naturalized in the United States. It is a climbing, straggling perennial plant with petioled leaves, bluish purple flowers, and at maturity the berry is red.

This plant has long been recognized as poisonous. Thus, I find an old European work that states that the berries of the plant were used to poison dogs and the juice of the fruit acts as a poison to rabbits. The authorities state that when used in considerable doses it is a narcotic poison, but it is not as violent as some other members of this family. It produces cerebral disturbances of a narcotic character. Formerly, the plant was used in medicine. Chemists have found the alkaloid solanin with a hot bitter taste, the principle dulcamarin and two other alkaloids.

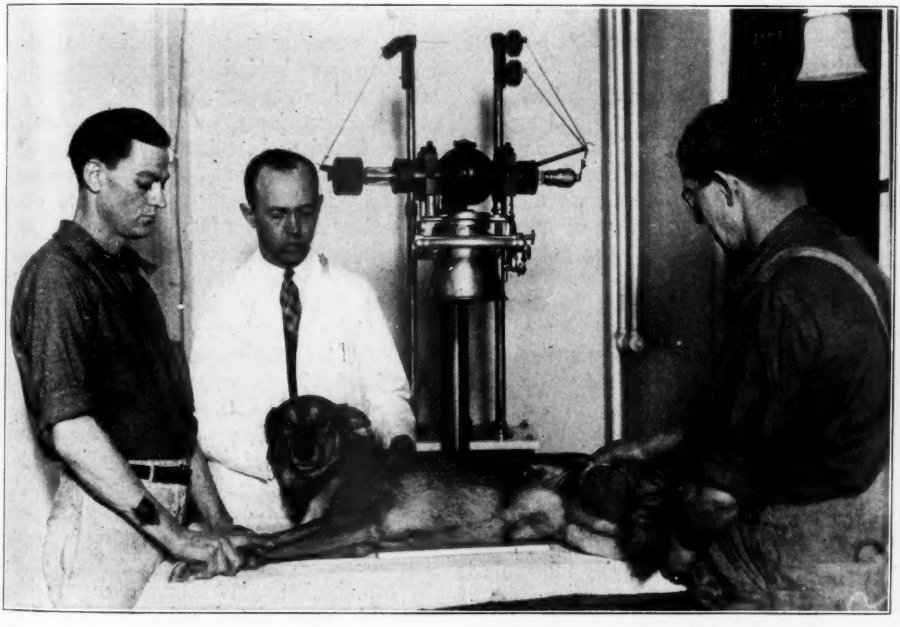
It is rather interesting to note in this connection that our native shrubby bittersweet is also somewhat poisonous. The red portion of our native bittersweet has a sweetish,

somewhat disagreeable taste. No doubt, under some conditions our woodland bittersweet is injurious to stock.

## CUD WEED, CORAL BERRY AND SPANISH NEEDLE

A CORRESPONDENT at Columbia, Iowa, sends a specimen of cud weed (Gnaphalium polycephalum) and writes, "We should like to know what it is and the nature of the plant, also if horses will eat it and what effect it would have on them if they did. Many farmers near here are having trouble with a disease among their cattle, particularly milk cows, and of course they are anxious to know what is the cause. This plant is new to them and the thought has occurred that it might be injurious." There is no record of poisoning from these plants so far as I know. The cud weed has a rather pleasant odor and it also has some medicinal properties. It has whitish leaves and heads and is common in dry pastures. Cattle do not generally eat the plant.

A correspondent in Kansas has sent a specimen of Spanish needle (Bidens cernua) and coral berry or buck brush (Symphoricarpos orbiculatus) supposedly poisonous to stock. There is no evidence that the Spanish needle or boot jack is poisonous, nor is there any evidence that our common buck brush or coral berry is poisonous. It is frequently cultivated for ornamental purposes because of the reddish berries. The seed of the Spanish needle sometimes produces mechanical injuries. It is found in low grounds and on borders of streams and lakes. I find that one of the exotic species of Symphoricarpos, to which our buck brush belongs, contains a saponin which is a poisonous substance. These saponinlike substances cause a breaking down of red blood corpuscles.



(International Newsreel Photo)

**X-Ray Laboratory of the Ellin Prince Speyer Hospital for Animals at New York City, said to be one of the finest of the sort in use. Extensive alterations and new additions, both in space and equipment, which have just been completed on this hospital make the institution one of the best of its kind in the world. The hospital is equipped with all the latest surgical apparatus, and five veterinarians are constantly at work attending to the many hundreds of animals that are brought there daily.**

# Swine Tuberculosis

H. M. MARTIN, University of Nebraska

THE TUBERCULOSIS of swine was definitely identified by scientific methods for the first time in 1875; although it is reasonable to suspect, however, that this disease has existed in swine from ancient times.

Tuberculosis of swine can be found in all countries where the growing of hogs go hand in hand with the production of cattle and poultry and especially when this disease is at all prevalent in these animals.

Tuberculosis of swine has, as a rule, been looked upon as being transmitted from cattle through the feeding of milk products or through the manure of feeding yards inhabited by both swine and cattle. This has been the accepted theory about the origin of swine tuberculosis, and no doubt was based upon sound experimental evidence at the time of its conception and for a considerable time thereafter.

While it has been known for a long time that swine were occasionally found to contract tuberculosis either directly or indirectly from poultry, such occurrences, at least in this country, were regarded as infrequent incidences. Even until quite recently it was believed that the eradication work among cattle would eventually eliminate tuberculosis from swine in that the greatest source of infection in swine was through the drinking of unpasteurized milk and through following diseased cattle.

The meat inspection returns for a number of years, however, point strongly to the possibility that some factor or factors, other than bovine infection, operating in the recognized manner, play an etiologic part in the production of swine tuberculosis.

The data pertaining to bovine tuberculosis show that the total retentions on account of tuberculosis in cattle, although slightly increasing or decreasing, remains, on the whole, close to the same level and during no one year does the number of retentions amount to more than 27 animals per thousand, slaughtered. The number of animals condemned adhere even more closely to a certain level, on the whole, following the curve representing the retentions.

The data pertaining to the condemnation of swine show that they are more stable during the period studied than are the condemnations of tuberculous cattle, practically ranging only between one and two hogs per thousand slaughtered. On the other hand, the records show that the number of swine retained for tuberculosis for every thousand animals slaughtered in the abattoirs where the government maintains meat inspection mounted from 13.83 in 1907 to 163.87 in 1922.

Thus the type of tuberculosis of swine which leads to condemnation has not materially increased during this time, while the type of localized, nonprogressive tuberculosis not resulting in condemnation has, during this same period, grown to more than ten times in frequency.

This great increase in the number of swine found to be tuberculous presented a problem, the solution of which seemed to be necessary before means of control could be devised or recommended. In the hope that the solution of this problem might be found, the Nebraska Agricultural Experiment Station undertook an investigation and attempted by experimental inquiry to determine the infection type of the tuberculosis associated with the animals which form the bulk of the retentions.

In view of the apparent increased incidence and spread of tuberculosis among poultry in a large hog-raising section, of which Nebraska forms a part, the experimental project mentioned was to a large extent so directed as to prove or disprove the hypothesis that avian infection may at least be held accountable for the great morbidity rate of tuberculosis among swine and its marked increase during the last fifteen years.

Evidence has been presented as early as 1904 that avian infection may cause tuberculosis in swine and from then on cases have

been reported from time to time from widely scattered areas. This evidence was apparently treated lightly in that little attention was paid to the possibility of avian infection playing a role in the great increase in tuberculosis in swine.

With all the fragmentary evidence recorded in literature, the Nebraska Station endeavored, above all, to ascertain the bacillary type found to be present in the lesions examined and to employ such methods that, if avian bacilli were present, the fact would not escape attention.

The typing was entirely accomplished by the use of animal inoculations. The animals used were the cavia and the fowl so as to bring to light the different pathogenic characters of the organisms present in the material studied.

This material consisted almost entirely of cervical and mesenteric lymphnodes of swine, affected with the more or less nonprogressive forms of tuberculosis, which constitute the bulk of retentions at the abattoirs and which group is, more than any other, responsible for the increased incidence of swine tuberculosis since 1907.

The results of the Nebraska experiments can be summarized as follows:

| | |
|---|---|
| Total number of consignments of swine examined | 250 |
| Shipments of swine with negative results | 31 |
| Shipments discarded | 2 |
| Shipments showing tuberculosis of probably avian origin | 8 |
| Shipments presenting definite conclusions | 209 |

Results obtained with the latter:

| Infection Types | Number | Percent |
|---|---|---|
| Mammalian | 11 | 5.21 |
| Avian | 185 | 88.51 |
| Mixed | 13 | 6.22 |
| Total Number Shipments | 209 | 99.94 |

As the investigations were in progress on Nebraska material, it was brought to the attention of the Nebraska Station that the hogs originating from Hillsdale County, Michigan, an accredited county, were being retained for tuberculosis at the Buffalo abattoirs. This interesting fact led to a study of fourteen different consignments of lymphnodes originating from Hillsdale County, and it was found that thirteen of the consignments contained avian tubercle bacilli; the other containing both avian and bovine tubercle bacilli.

During the investigation surveys of sixteen farms from which tuberculous hogs originated were made.

In each instance the survey revealed the presence of the exact type of tuberculosis as was found by experimental methods in the laboratory. Fifteen of the farm surveys revealed the presence of tuberculosis in the poultry only, the sixteenth farm showing only cattle tuberculosis.

Another point disclosed by the field survey was when swine could be tested positive reactions were more constant to avian than to mammalian tuberculin.

The results of the Nebraska experiments permit the following conclusions:

The type of swine tuberculosis which is responsible for the increased retentions of carcasses and the condemnations of parts is for the greater part due to infection of avian origin.

In the eradication and control of swine tuberculosis, success can only be obtained when the two chief sources of infection, namely, the tuberculous cattle herd and the tuberculous poultry flock can be regarded as equally important.

There are indications that the steady increase in the incidence of swine tuberculosis as shown by the abattoir statistics reflects a similar increase in the spread of avian tuberculosis in a large part of the United States.

In the intradermal tuberculin test of swine in which mammalian tuberculin is used a considerable number of cases of tuberculosis will escape detection. For dependable results avian tuberculin must also be used.

In the bacteriologic diagnosis of tuberculosis of swine by animal inoculation tests, the results will, for a large proportion of cases, remain inconclusive when only guinea pigs are used for this purpose. In the case of swine, at least, some laboratory animal

susceptible to both avian and mammalian tuberculin should be included in the experiment.—Univ. of Penna. Veterinary Extension Quarterly.

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# Sterility and Its Control Among Dairy Animals

J. W. BROWN, Ft. Scott, Kansas

STERILITY AMONG HIS ANIMALS is the one main grief of the dairyman after he has secured a market for his products. Being located in a large dairy center, the writer has had an opportunity to note this condition from the start to its full development among dairy cattle. This locality as a dairy center has been established only about ten years, and most of the foundation stock was shipped in from other dairy states. The local dairymen, new in this branch of stock raising, have had to rely greatly on the help of the local veterinarians to tide them over until this sapping disease of the industry could be conquered or controlled. Thus, it has offered the writer an intensive study of the condition and its control, having observed it in all breeds of dairy animals.

Sterility in dairy cattle may be divided into two main classes. First, congenital, which normally never exceeds two per cent in the average community of fifty thousand to one hundred thousand animals. Second acquired sterility, which may be divided into temporary and permanent, and each of these may be brought about by any of the following conditions and thereby controlled by their correction: 1, feeding; 2, location; 3, early breeding; 4, care of female animals following parturition; 5, improper breeding; 6, infections; 7, paralysis and extra-uterine pregnancy. The control of these causative factors may be listed under the following heads: 1, corrective feeding; 2, physical and sanitary improvements; 3, skilled treatment.

## Congenital Sterility

This is either temporary or permanent (almost always permanent) and exists from the birth of the female or male animal, as in the case of free martins, male and female twins. In such instances, the female has always been found to be sterile, but this is not always the case with the male twin.

Another condition noted by the writer has been the absence of testicles in male calves. Observation in these instances has been limited, as such animals seldom reach maturity due to early disposal of them for their meat value. There are also instances where the male has one enlarged testicle and the other is in an atrophied condition. A similar condition has been noted under acquired sterility, and the two differ only in that one is noticed at birth of the animal and the other after maturity or near the time of maturity. Sterility has also been observed in animals classed as hermaphrodites or two-sexed individuals.

As to congenital sterility in female animals, there are many more cases for observation than in the male, but it is difficult in most of the instances observed to distinguish between the congenital and acquired form due to the anatomical location of the female reproductive organs, as the observation is made usually when the subject has about reached maturity, when enough time has elapsed so that the case may be of the acquired type. Cases of misplacement of the reproductive organs and absence of a developed vagina have been observed, and these without doubt may all be classed as congenital sterility and of the permanent form.

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### Acquired Sterility

*1. Feeding:* The system used by many of raising young stock carelessly to the extent of not feeding them a good growing ration, thereby weakening their vitality, leaving the body susceptible to various infections and at the same time causing a stunting of the growth, has a tendency to weaken the fecundity of the young animals when they reach maturity. Here we become involved in the much discussed subject of mineral feeds and the part they play in preventing sterility. By skimpy feeding of the young on poor feed deficient in elements for the making of nerve, bone and muscle, we are confronted with rickets and scurvy, ringworm and internal parasites, with weakening of the reproductive organs due to the general systemic weakness. Again we find that grain raised on soil exhausted of plant food does not contain enough assimilable minerals for the young growing animals. This produces a tendency to late maturity of the weakened animal, and when nature is called upon to reproduce, the subject is so weak that the offspring will be more or less susceptible to sterility. Again where group feeding is practiced, the strong starve the weak, and if any infection exists, it is readily scattered among the animals.

*2. Premises and Their Location for the Dairy Home:* Closely associated with feeding are the premises and their location in the part they play in temporary and permanent sterility. Under this head are included the calf pens, milk barn, exercise lots and pastures. These places are the home of the young dairy animals from their birth until maturity. On premises long infected with contagious diseases such as abortion, tuberculosis, dysentery and internal parasites, unless rigid sanitary measures (whitewashing, disinfecting and vacating) are practiced, together with proper feeding, the young growing animals become infected in early life with the Bang bacillus, mixed infection (streptococcus, staphylococcus, B. paratyphosus, B. pyocyaneus, B. coli, B. tuberculosis, etc.) which is soon shown in calf scour, dysentery, enteritis and many other maladies that lead to unthriftiness and tend to poor development. The result is poorly developed reproductive organs both in the male and the female and especially in the female. This brings about a tendency toward temporary sterility in the first and second generation of the offspring. The writer has carefully checked these facts over a period of eight years in a number of herds.

*3. Early Breeding:* This is a very important subject when looked upon as one of the added causes of sterility, especially in a young dairy community. The dairyman, ever ready to get increased milk production, often breeds his young heifers at an age that has a tendency to check their maturing into strong animals. I believe this abuse has been practiced for years in the Jerseys to such an extent that they have not the physique and stamina of the Guernsey and Swiss animals, although they belong practically to the same class. Where good feeding and sanitation are practiced from calfhood until the animals reach the age of a year to a year and six months, this factor of early breeding is not so important in causing sterility. For the animal has acquired a good strong physique that will enable it to give ample support to the young and delicate reproductive organs of the female in time of pregnancy. As to males, even if good care has been given them, experience has taught that best results are obtained after the second year of age. But if the same treatment as given the female in regard to feed and sanitary surroundings is not practiced, no matter what the breed, early breeding has a tendency to be too great a drain on the system, bringing about poorly developed offspring and weakened reproductive organs in the male and female. This leaves the system more ready to succumb to infections such as abortion and tuberculosis, tending to bring about temporary sterility followed by permanent sterility at an early age.

*4. Care of the Dairy Cow During Parturition*: Another important matter is in the care given the heifer as well as the older dairy female during the period she is giving birth to her young. First to be considered

are injuries to the female reproductive organs such as lacerations of the vagina or the neck of the uterus or the uterus itself, all of which lead to inflammation of the parts. If not properly treated this may result in sterility, and when the injuries are met in physically weak and improperly developed animals, no matter how skillfully treated, the condition may terminate in death of the mother or her loss to the herd as a good breeder. Also might be mentioned too rough handling of young female animals in delivery where the fetus is unusually large and the os uteri not properly dilated, causing that trouble known as rigid os uteri, resulting in a temporary sterility due to the difficulty of proper copulation with the male. These animals are called hard breeders.

Then comes the next source of sterility—douching with too strong an antiseptic solution, too much force and douching at the wrong time. Due to the delicate structure of the uterus, only the weakest of antiseptics should be used. When too strong they work to disadvantage because they cause a swelling of the cells of the membranes of the uterus, which have been functioning for nine months to assist the fetus and are at this time weaker than ever and easily ruptured, causing their death and sloughing. Yet, where warm, weak solutions such as salt or permanganate of potash and sugar are used, we help nature by helping the veins that have lost their elasticity to dilate and contract, thus carrying away the waste products, while the capillaries are bringing fresh blood as a nutrient to the overworked cells.

Force used in the introduction of fluids in the female reproductive organs plays its part in rupturing and destroying the cells in many places of the weakened uterus, thus setting up an inflammation that almost always proves fatal to the animal or ends in sterility.

As to douching at the wrong time, it has been the writer's experience in those cases where infection exists in the uterus and gives evidence of being localized, the douching must be used with extreme care and only to help wash out the infective material by diluting it. If much liquid or force is used in these cases, it has a tendency to scatter what may be a uterine infection to the fallopian tubes causing fallopitis and even inflammation of the ovaries, which in the end produces permanent sterility.

Next to consider after douching of the female at parturition is that of carrying infection from one animal to another due to the difficulty of sterilizing and keeping sterilized the rubber tubing used in douching. One should have two or more tubes, each to be used on certain classes of uterine infections. Many cases of contagious abortion result from transmission to non-infected herds through the douching tube. Also mixed infection is produced in this way, catarrh of the vagina, infectious vaginitis, etc.

Following douching as a cause of sterility comes manipulation. This includes delivery of the fetus in cases of dystocia, rupturing of ovarian cysts and massage of the infected womb. Rupture of the walls of the uterus frequently happens in the handling of cases of dystocia where care and thorough examination of the condition of the uterus are not practiced before too much force is used in relieving the condition. Again excessive activity of the fetus when abnormal presentation happens, causes rupture that is of serious consequence, leading to permanent sterility. In the rupturing of cystic ovaries, manipulation and caution always play an important part in relieving temporary sterility, but if the operation is roughly performed, a case that might have been corrected may pass from temporary to permanent sterility. This is brought about by displacement of the ovarian ligaments, peritonitis or ovaritis.

*5. Selection and Handling of Breeding Stock:* Under this heading, much may be accomplished in warding off many of the causes that contribute to sterility in a dairy herd. One should have a definite purpose in mind as to standards desired in selecting the breed, physique and milk production. The male to be placed at the head of a herd should be selected because of purity of his

ancestors, strong physical qualifications and well developed generative organs. He should be taken from a prolific strain free from contagious abortion, and his physically strong points should be considered so as to counterbalance the weak physical points in the female animals of the herd he is to head.

The female members of the herd should be selected with precaution equal to that used in choosing the male. Special attention should be given to animals with strong, well developed pelvis, pinkest color of the membranes of the vulva and vagina, well developed os uteri and well developed hind quarters in general. Needless to say, the strain should be kept pure and healthy, and animals should be chosen from herds free from infectious diseases such as abortion, tuberculosis and vaginitis. If selection of breeding animals is practiced along the lines described, the offspring will have a tendency to develop strong physical constitutions as well as healthy and strong reproductive organs, and if carried out for a few years where line breeding is practiced, it will have a tendency to prevent outcroppings. The strongly developed offspring will have a greater resistance to disease and accidents that tend toward sterility.

After selection of animals, the next important factor is handling them so as to prevent overwork of the male, which if not practiced brings on early sterility and impotency. Best results are obtained when the animals have reached full maturity, not always to be judged according to age as this differs in different breeds, but physical maturity as well as age should be noted. Exception to this rule may be made in well regulated herds where two or three males are kept, using the senior male on the majority of the stock and the younger male on one or two strong animals to season him. Also this serves as a check on his potency and causes him in some cases to remain docile.

The practice of limiting the male's work by allowing the mature animal only one or two services per day is good, and nothing but well developed and healthy females should be used. This will serve to the advantage of his requiring not over two services to any animal in any one day. This is in decided contrast to the method used by some herdmen of allowing the males to keep serving a single animal, thereby not only weakening the male but subjecting the female to injuries of her reproductive organs. In large herds it is to the best advantage of the herd to use the male the year around, not allowing any long rest periods. This can be arranged in a few years planning so that cows come fresh in the herd each month of the year. This method serves to keep the male regularly employed and more docile and is a greater financial asset to the herd as it keeps the quantity of the milk up the year around. Also the owner gets more service from his males yearly with less drain on the stamina of the animals.

Next to be considered is the physical care of the male animals. First, the food of the male used for breeding should be selected to give plenty of nutriment and keep up his physical strength, which is a great factor in maintaining his potency as a breeder. Regular exercise should not be neglected. He should always be kept by himself except during pasturing seasons, when he may be pastured with young growing calves. He should at all times have plenty of pure, clean water. His penis should be kept as clean as the maternity pens. This is very often neglected in some of the best regulated herds. Special attention should be given to the care of the sheath so as to keep it clean. The hairs should be trimmed from around the opening as they often grow back, become matted and act as a source of irritation to the sheath, which if permitted to continue causes serious trouble. Another source of trouble with the male sheath is that it secretes a sticky substance, and this coupled with the bull's practice of dribbling his urine, often leads to calcareous deposits and strictures of the opening, which conditions tend to cause either temporary or permanent sterility. To get the best service from the male, he should not be kept fat like show animals as this causes him to become lazy and sexually sterile.

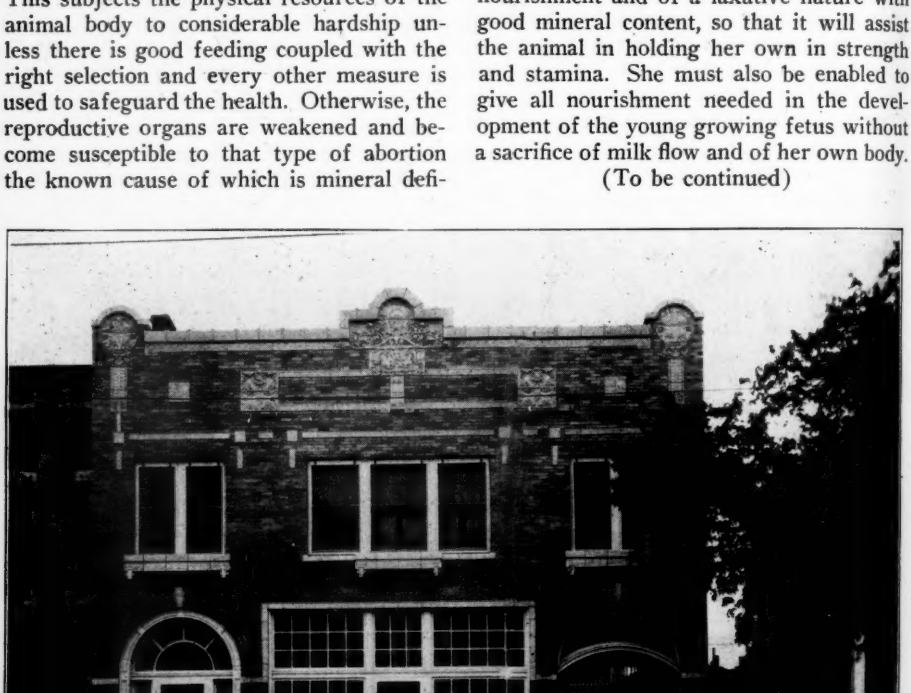
When starvation or poor feeding of the

male animal is practiced during the winter months, his resistance is weakened, subjecting him to infectious diseases which often leave him sexually weak or sterile.

In hygiene as applied to female animals, first in importance is not to keep them too fat, yet in a condition that will promote the maximum physical strength. As these animals must produce a calf a year to be profitable to the herd and owner, there is quite a strain on the system to maintain a good flow of milk and yet carry a young growing fetus for nine months of the year. This subjects the physical resources of the animal body to considerable hardship unless there is good feeding coupled with the right selection and every other measure is used to safeguard the health. Otherwise, the reproductive organs are weakened and become susceptible to that type of abortion the known cause of which is mineral deficiency. The pregnant animal should be exercised regularly, fed regularly and protected from other animals during the latter stages to prevent riding, hooking and chasing, all of which tend to cause abortion, which in turn affects the reproductive organs so as to bring about early sterility.

Another point under hygiene of the female dairy animals is that they should be watched closely during the heat periods to prevent crosses of animals of inferior classes and other types such as beef, dual purpose, etc. As to diet, it should not be for fat, but nourishment and of a laxative nature with good mineral content, so that it will assist the animal in holding her own in strength and stamina. She must also be enabled to give all nourishment needed in the development of the young growing fetus without a sacrifice of milk flow and of her own body.

(To be continued)



**The new veterinary hospital of Dr. Edward M. Lang, 716 East Broadway, Louisville, Ky. It comprises four distinct wards—first, the medical department; second, the surgical department with two operating rooms (one for large animals and one for small animals); third, the observation wards; and fourth, a separate building for distemper patients.**

# CASE REPORTS

## ACETONE-PIXOL AS AN ANTISEPTIC

I wish to give a little report on favorable results obtained from a prescription contained in the Veterinary Medicine premium book, "Veterinary Prescriptions."

Undoubtedly all fellow veterinarians are constantly seeking for a better antiseptic and for cheaper production of the same. I have found nothing to equal the iodin substitute—

| | |
|---|---|
| Acetone | 40 parts |
| Denatured alcohol | 58 parts |
| Pixol | 2 parts |

One of its great advantages as an antiseptic is that it is stainless. It is irritating to the raw surface for a short time but disinfects as thoroughly as boiling would. As a result of a thorough trial of it, I have substituted for the old eight-ounce bottle of iodin, a small two-ounce bottle, and carry a sixteen-ounce bottle of the acetone solution instead.

A summary of its uses and results as obtained by me is as follows: First, to wash the hands and seat of operation in all surgical work. Second, to swab all infected open wounds. Third, to occasionally inject into pus cavities hard to drain to kill the pus organisms. Fourth, in vaccinating as a skin cleanser and disinfectant at the site of operation. Fifth, to cut all sebaceous deposits in the hair of animals. Sixth, especially useful in small animal wounds of depth to insure sterility of the wound. Probably there are many other uses in which I have not had occasion to try it.

A few examples of its efficiency in my practice are:

First: over 3,000 hogs vaccinated since July 1st, and on as close a check-up as possible, no abscesses. Of course, other precautions were taken to prevent infection. It not only disinfects in these cases on the surface but seems to cut the fat film of the skin and get down into it.

Second: a dog with an abscess of the poll, cause unknown, owner poor as Job's turkey; opened abscess with minute puncture and evacuated pus by pressure; put a few cc. of the acetone solution in hypodermic syringe and entered the syringe adapter, no needle, held it tightly against skin and injected. Three days later, no pus in the pocket, abscess wall which was extensive apparently largely resorbed, and with daily injections of yellow oxid of mercury, as put up in long-nozzled tubes, into the abscess, prompt and rapid healing resulted with no further pus. This dog was of the dirty, long-haired cur type not worth one's bill to operate on to drain the large abscess extending on both sides of the neck.

Third: a cat with a bullet hole through both legs in such a manner that it passed under the skin of the abdomen and did not exit until it reached the outer surface of the other leg. I injected the acetone solution from each opening and coated the openings with antiseptic ointment. The cat never realized it was shot but did twist his tail a few times on injection of the solution.

Fourth: a horse with a wound in the region of the stifle, infected, very lame, not worth a call ten miles out to drain the abscess. The acetone solution was injected daily resulting in an uneventful recovery.

Fifth: a cow with infected sinus, parts washed out with peroxid and the owner was left a syringe with which to inject the acetone solution every day. Prompt healing resulted with no further pus.

Sixth: sheep torn by dogs, wounds swabbed once daily with the solution and cavities injected. I only tried this once but obtained so much better results that I shall have to try it again.

For a short time the solution seems to burn severely but this does not appear to last long, and it does do the business, so I employ it sometimes when one would hesitate with some owners. However, a little pain and prompt relief beats a long course.

Its cost is about one-third that of iodin, and I am anxious to try it further and to

hear from anyone who may try it after reading this.

Newton, Iowa P. L. Stow

## ANSWERS TO KINSLEY'S QUERIES ON HORSE PRACTICE

In the February issue of Veterinary Medicine, under "Items of Interest to the Practitioner," Dr. A. T. Kinsley propounded the following queries as being pertinent at this time owing to the revival of a good demand for horses and mules among farmers and dealers:

What is an effective method of breaking a horse or mule of halter pulling?

How can a mare be tied so that her young foal will not get hung in the halter strap?

Is there a simple, inexpensive effective method of breaking a horse that kicks while hitched?

What does a horseman mean when he states that a certain horse is "a cold collar"?

What is the cause and treatment of chest founder?

Is "cross firing" a serious defect in a harness horse?

Is there an effective method of overcoming a lugger?

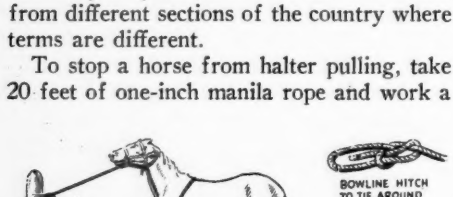
What is meant by the phrase, "smokes his pipe"?

Is there any method of shoeing that will effectively overcome winging?

What is the cause and treatment for tongue lolling?

To these questions, I am submitting the following replies, with the thought in mind that they may stimulate further discussion from different sections of the country where terms are different.

To stop a horse from halter pulling, take 20 feet of one-inch manila rope and work a




loop in one end, over hondo if one large enough is obtainable (also called rope eye). Pass the rope around the horse's body just back of the forelegs and pass the end through the hondo, forming a snug loop around the body about where the backband of a harness would be. Pass the end of the rope between the forelegs and to ring in manger or post three and one-half feet from the ground. (Do not get too low nor too high.) Pass the end back without tying through the halter ring and tie around the horse's neck with a bowline hitch. Then make the horse pull by shaking a sack in his face or a newspaper. After a few pulls, he is through, often never pulling again. Some are more obstinate than others.

A mare can be tied so the foal will not get hung in the halter strap by putting the mare and foal in a box stall or pen and tying the door shut with the halter strap.

A horse can be broken from kicking in single harness by using the Freeman overdraw device, designed by my father, Prof. H. B. Freeman, Sacramento, Cal., horse trainer and educator.

A horseman referring to a horse as a "cold collar" means one that will not pull in the morning until he is warmed up, one that must be warmed up to a light load or to an empty vehicle before being hitched to a load, after which he may work well the rest of the day, but he repeats the performance the next morning.

"Chest founder" is a term used to designate a horse tied up in the shoulders from abuse, usually hard driving, getting heated up and then being tied in the cold wind to cool off while the owner enjoys a few drinks and a game of poker. Cure is rather difficult, unless it can be undertaken within a few hours after exposure. Use prophylaxis on the driver.

"Cross firing" is a very serious defect of driving horses. It means hitting the left front foot or leg with the right hind foot, or right front with the left hind foot. The greater the speed the greater the damage. In some cases it takes the form of "speedy cut," which is the cutting of the anterior portion of the metatarsus with the toe of the front foot, but a horse can speedy cut without cross firing, it being a common defect with trotters. Only a pacer can speedy cut by cross firing. A

wing shoe will prevent this by checking the cross stride in most cases. Also toe weights are used for this purpose.

A "lugger" can be handled very effectively by use of the Freeman compound overcheck in conjunction with the Sandborn 4-ring bit. This is another device perfected by my father, Prof. H. B. Freeman.

Different sections have different terms, but the usual use of the term "smokes his pipe" is applied to a horse with pulmonary emphysema (heaves), the name having originated in those cases where there was a suction of air through the rectum during respiration, when some of the quacks used to try to treat the condition by taking a corncob pipe full of tobacco, lighting it and placing the stem in the animal's rectum, whereupon the horse would proceed to enjoy a smoke at the owner's expense.

The term "winging" or "peddling" is applied to a case of faulty conformation, where the horse's foot sets at an angle to the line of travel. Some toe out, and when they pick up their feet in trotting they hit the canon of the opposite leg or the knee; others toe in and swing their feet out, in which condition they do no great damage but their gait is unsightly. This condition can be helped by making a square break-over at the toe and by weighting the heels with a long calk. However as it is principally a fault in the conformation, if bad, it is hard to overcome.

"Tongue lolling" is in most cases a bad habit, although occasionally it is caused by a paralysis of certain muscles of the tongue. The condition is caused by the horse carrying his tongue over the bit instead of under it as he should. As a rule, the Perfection combination snaffle and check bit is a help with harness horses, and there is a special bit on the market with a disc in the center extending up into the mouth like a spade bit which prevents the horse getting his tongue over it. Often the use of a curb bit with a spade mouth bar will cure this habit. Also the halfbreed mouth piece helps. If it is due to paralysis, then the only help would be partial amputation of the tongue.

Gridley, Cal. S. A. Freeman, D. V. M.

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## CIRRHOSIS OF THE LIVER

We hear very little in regard to diseases of the liver, especially in the ox and horse, although I believe that quite a number of cases of indigestion and colic are caused from poor secretion of this functioning organ through moldy feed, ensilage, clover hay and bad roots. I consider that when a farmer feeds moldy fodder, he is feeding trouble, especially ensilage and sweet clover. They have caused quite a lot of deaths in this province among young stock.

The case I am writing about was first brought to my attention on September 21, 1924. A chestnut gelding, 14 years, weight about 1500 pounds, had been failing in flesh and showing slight colicky pains on and off for two weeks. The symptoms noted were trembling, loss of coordination, dullness, fetid breath, sticky mouth, tight skin (hidebound), mucous membrane of mouth and nostrils quite yellow in color, pulse 35-40, temperature 103. Diagnosis, hepatitis.

On pressure over the right ribs, the animal would show pain. The owner stated the horse was losing flesh very fast and had a poor appetite. The prognosis was doubtful.

Medicinal treatment consisted of the following:

℞

| | |
|---|---|
| Pulv. Barb. aloes | ʒiv |
| Calomel | ʒii |
| Pulv. ipecac | ʒi |

M.

Sig. Fiat bolus 1.

also the following powders:

℞

| | |
|---|---|
| Sodium salicylate | ʒvi |
| Mag. sulph. | ʒxii |

M.

Sig. Large tablespoonful t. i. d. on tongue or in bran mash.

External treatment consisted of a cantharides blister rubbed well in over the right side. Four daily visits were made.

The patient started to improve on the fourth day, eating a bran mash three times daily, also a little second cutting of alfalfa hay.

The horse was kept on a soft diet all last winter—steamed bran, boiled grain, hay and roots free from dust or mold. Daily doses of

sodium bicarbonate and magnesium sulphate, two tablespoonfuls, were given. The patient did his work, although he lacked his previous ambition. The owner stated the animal seemed dull at times and picky on boiled grain and roots, also getting very lazy.

On May 12, 1925, I was again called to see this horse. On arrival I found the animal lying in a box stall partly on the hind legs braced against the wall, sweating profusely. He was pulled into position so he could rise, which he did with help. The pulse was weak, nearly intermittent, breathing heavy, and when the horse was moved he seemed very stiff and sore. The owner stated the animal had done his share of spring work putting in the crop, etc., but was getting very lazy with no ambition, and "Look at his belly, doctor; it's a hell of a belly and he has a great thirst, especially when at work."

This was one thing I noticed when the horse got to his feet—the distended abdomen, which had developed tremendously since my last visit in September, 1924. The patient was given the following, hypodermically:

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| | |
|---|---|
| Lobelin | grs. 1-10 |
| Arecalin | grs. ½ |
| Strych. sulph. | grs. ½ |

The animal was rubbed dry with straw and blanketed. He got over this attack without any further treatment. A treatment of potassium iodid was advised, but the owner did not want to undergo the expense, so I advised turning the horse to pasture. He remained on pasture until July, when he was needed to help harvest the crop.

The owner was in one day and said the horse had improved wonderfully, although he still carried too much belly, but was not so sluggish and was working fairly well. I did not see the patient again until December 2, 1925. On that date I received an early morning call, informing me that the horse was dying or anyway in very bad shape.

On arrival I found the horse down, dying, unable to rise. He died about five minutes after I arrived.

At postmortem examination, on opening the abdominal cavity, the first thing we removed was about thirty to forty gallons of fluid (ascites). This partly accounted for the size of the abdominal distention. After the fluid was removed, we had no trouble in finding what was the cause of death. The liver was quite three to four times its natural size. The right lobe was especially enlarged and over eight to ten inches thick. It showed bluish patches intermixed with yellow. The left lobe was dark chocolate to light yellow in color. The bile duct was full of a thick, dark-colored bile (sticky), leaving a stain on the hands which was hard to remove with soap and water. The portal vein was enlarged. The right lobe was very hard, uneven to the touch (lumpy), and on being cut in section this lumpiness was still felt. It also showed the mottled colors, light and dark. The left lobe was smooth but on section was quite yellow throughout.

The left kidney was enlarged, soft and spongy. On section, a dark fluid was found in the interlobular arteries. The right kidney appeared normal.

The spleen was enlarged, hard, nearly rounded on itself instead of flat, and soft; in fact, it was nearly curled together and felt and cut like rubber.

The bowels had very little ingesta in any part. What was there had a nasty odor, was very dark and quite soft. This peculiar odor was noticed from the mouth of the patient before death.

I only wish I was a pathologist so that I could go more fully into the functioning of this organ.

P. K. Walters, V. S.

Thorndale, Ontario

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Involution forms occurring in bacterial cultures were formerly considered as reversion or degenerate types induced by environments that were not favorable to normal fission. It has recently been shown that the various stages of the process of the development of involution forms parallel the process of isogamic conjugation or zygospore formation that occurs in many of the yeasts. It has been demonstrated that these involution forms of some bacteria, especially the colon-typhoid and diphtheria will germinate when provided proper environments. In some instances the progeny of involution forms many acquire new characters or latent characteristics may be rejuvenated. Thus, many intricate problems of infection may be revealed.

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Two cases of carcinoma developed in mice as a result of a single application of hot tar. In these experiments the temperature of the tar was 70°C. The cancer producing substance appears to be present in the higher-boiling fractions although this has not been definitely proved. The exact nature of the cancer producing substance has not been determined. It would appear as though carcinoma would be

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relatively prevalent in the workers that are more or less constantly in contact with coal tar and it would be interesting to have a detailed record of the cause of death or at least the occurrence of carcinoma in such operators.

## ANEMIA AND DEATH FROM SAND IN THE GREAT COLON

The animal was a three-year-old mare, smooth limbed and emaciated, weighing about 1100 pounds. The mare while a colt and up until five months before death had suffered from recurrent dislocation of the patella on both stifles, which perhaps goes to show that she was primarily of a weak constitution. When the owner consulted me five months previously, I advised a strong blister on both stifles and rest in the barn for three days, with sidelines to prevent the hind legs from being too far extended. He did this and reported that he observed one stifle dislocated only once after treatment. The mare was raised in a district noted for its sandy soil, and the name "Sandy Flat" is rightfully applied to the district. The owner stated that the mare commenced to lose flesh about four months before death. However, since her appetite remained good until the last day, he did not seek veterinary advice. Since it is customary and interesting to bring in human nature with our reports, I wish to state that he sought the advice of a neighbor. This neighbor had a bottle of so-called "mountain fever medicine" left since eight years before, and since it was a shame to let the medicine go to waste, he gave this bottle to the owner of the mare, and he used it. When the mare failed to improve he called me.

On my arrival I found the animal a shadow of its former self; gait wobbly; could hardly lift the feet from the ground; abdomen drawn up; respiration 30; pulse 104, weak and wiry; also venous pulse. Conjunctiva and all visible muscous membranes were pale, almost white. The hemoglobin test surprised me, for never before had I seen a hemoglobin test of 30 per cent.

I made a diagnosis of anemia from unknown cause, possibly pernicious anemia, since this is quite common in that district.

To determine the cause of the anemia and clinch my diagnosis I advised immediate destruction of the animal, and performed a post-mortem operation. In the sternal flexure of the great colon, I found a collection of fine sand, the estimated weight of which was 50 pounds. The sand was not packed hard, but some feed had been able to pass by it. The stomach was full of feed, but the part of the bowels posterior to the collection of sand were almost empty. What surprised me also was that there was no inflammation of any parts of the intestines surrounding the collection of sand. Nor did the liver, spleen and kidneys appear diseased. The heart sac, however, contained about a quart of fluid, and the abdominal cavity about one-half gallon of serum.

It was my first experience of this kind. If I had seen this animal earlier, and if I had been able to diagnose the trouble, I should not have known how to treat it. Perhaps I should have tried the water treatment, pumping in 10-15 gallons of tepid water every day for a week, if the owner had been willing to go to the expense. This might have washed out some of the sand.

The owner informed me that he had observed the mare eating sand at various times, and I also witnessed his other horses on the farm do likewise. I concluded that they craved some mineral elements that the feed lacked, and recommended a mixture of bone meal, slaked lime, coarse table salt, sulphur and charcoal, to be put in a trough where the horses could lick it whenever they wished.

O. W. Johnson

Davenport, Wash.

## CHRONIC COUGH IN A COW

I have been treating a case in a cow that coughs a good deal, and the trouble seems to be in the throat. The man that gave me the cow said he had never seen her chew any cud since he bought her two months ago. Aside from the cough, the cow seems to be in good condition, and her bowels move normally. I gave a purgative some time ago but it did not help the cough. I examined the throat but could not find anything wrong with it.—W. G.

**Reply:** There are a number of conditions that might cause a chronic cough in a cow and yet be rather obscure. Traumatic pericarditis might occasion this in the early stages, as might also an atheroma of the aorta pressing against the trachea, or any other mechanical interference with the trachea or bronchi. In such conditions, treatment would help but little. Sometimes a cough of this nature is due to a tenacious exudate in the bronchi or bronchioles that is sort of self perpetuating. For such conditions, ammonium chlorid in two-dram doses three times daily for a period of ten days, is often effective.

## IMPACTION OF THE RUMEN

I have selected this malady because it is very common among cattle at certain times of the year. Living in the very heart of the dairy industry, I have had a great number of these cases. I have worked out a method of treatment which has served me well and which I should like to impart to other members of the profession. Generally one is called to treat these cases after the owner and all his neighbors have tried their pet remedies and obtained no results. This makes it very annoying to the practitioner.

As to diagnosis, this is really not very hard to make, although one seldom sees two cases that are exactly alike. Invariably one will find the patient humped up, and when viewed from a position directly behind the animal, a decided curvature of the spine is noticeable. This curvature is always to the right and seems to relieve the animal of some pain. I shall not go into details in regard to this ailment because I think other veterinarians detect it readily. So much for the symptoms, but let me give a word of caution in regard to the prognosis, which should be guarded in all such cases.

Occasionally one is called to a case that has received no medical attention. Such cases are ideal to work on. After a thorough examination so that I am convinced that impaction is present, I administer generally in capsule the following:

| | |
|---|---|
| Aromatic spirits of ammonia | ℥i ℥iv |
| Fluid extract of digitalis | ℥i |
| Fluid extract of nux vomica | ℥ii |
| Tincture of capsicum | ℥ii |

The reason for giving these drugs is that the aromatic spirits of ammonia acts as a general stimulant and also tends to condense what gases are present; the digitalis supports the heart and also has a mild stimulative action on the muscular coat of the alimentary canal; nux vomica is also a powerful stimulant of these muscles; and tincture of capsicum is a carminative and tends to heat the body.

I then leave enough nux vomica for about five or six doses, instructing the attendant that a teaspoonful be given every hour until all is given. I also caution him to be on the lookout for the full medicinal action of the drug before each dose is administered. This is accomplished by tapping the animal on the back or kicking the stanchion. If either one of these tests will cause the patient to jerk as though she had received an electric shock, no more of the medicine should be given, whether it be the second dose or the sixth. I wish to add also that the Holstein breed will endure more nux vomica than the Jersey or Guernsey, and it is well to keep this in mind when treating such cases.

It will be noticed that no salts or other purgatives have been given up to this time. Now on making the return call, when the patient is examined, one will find an entirely different subject. Usually peristalsis is very much in evidence, and this is the proper time to give a good dose of Epsom or Glauber's salt. I generally give one and one-half to two pounds according to the size and weight of the animal. A big mistake is made in giving a cathartic before the animal is properly prepared to receive it.

Then to go ahead with the treatment, I now leave a rumen accelerator, made up of the well known combination of barium chlorid, tartar emetic, eserin, etc., one or two tablets to be given every four to six hours as the case may require. If no satisfactory results are obtained in twelve or twenty-four hours, I begin giving liquid paraffin or raw linseed oil in small doses, eight to sixteen ounces, every six hours until purgation is established. It is well to administer stimulants every three hours, which tends to support the animal.

I never give a second dose of salts or any drastic purgative, because I think they are contraindicated in almost all alimentary troubles. I believe that a great many cattle would have overcome this condition if the second dose of salts had not been given. We all know that salts create a mild inflammation of the bowels, thereby causing them to weep. This weeping is supposed to soften the bowel contents, but if it does not, the impaction remains fixed, and when a second dose is given, more inflammation is created, less weeping is in evidence, and the impacted mass begins to bake on to the surrounding tissues. When this occurs, it generally spells "exit cow."

On the other hand, when oil is given, there is an entirely different action. Oil also will soften impacted masses, but instead of irritating the bowels, it lubricates and soothes them. I have given as much as one gallon of oil before results were obtained and with no ill effects to the animal. Of course, the oil was given in pint doses.

If all these methods of treatment fail to cause evacuation, one still has another chance left to save the life of the patient, and that is rumenotomy. I shall not attempt to indicate the proper time to operate as it depends entirely on the condition of the patient, but will say this —do not wait too long or until the patient is

exhausted. If animals are operated on in time, wonderful results may be accomplished. When opening the paunch, one should not remove all of the contents. I find it is not advisable to remove more than three-fourths of the contents. When this has been done, loosen the remainder and pour in about twelve quarts of normal saline solution at body temperature as this tends to prevent shock. Stimulants such as aromatic spirits of ammonia, nux vomica, etc., are left to be given at three or six hour intervals as the case may require. All food should be withheld from the animal until purgation is established, while on the other hand, all the water that the patient will drink should be given.

Although this disease and treatment present nothing new to the average practitioner, I hope this report will come into the hands of some of the younger men of the profession and that they will remember what I have said in regard to giving that second dose of salts.

L. H. Allen

Albany, Wis.

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## WAS THIS PARTURIENT PARESIS?

About 5:30 a. m., December 5, 1925, I was called six miles west to the farm of Mr. Albert Huber, Coffeen, Ill. Mr. Huber stated over the telephone that he had a sick cow, and on my asking what seemed to be the nature of the trouble, he replied that he did not know but that the cow was in good health and ate heartily the previous evening but was now acting queerly. She wanted to walk constantly in a circle and if tied would "dance with her hind feet," as he expressed it.

I usually make it a point to question a client when receiving a call over the telephone to get some hint as to what the trouble is and often am much better prepared to treat the case in the way of proper remedies taken along. I am also often reminded of some particular instrument which might be needed. I wonder if other practitioners use this method of getting some idea as to the nature of the case before starting on a call. I remember once on answering the telephone, a nearby farmer asked me to come out to his place to see a sick horse, and I asked him bluntly what the trouble was, to which he replied, "I don't know—that's what I want you for." Since then I am somewhat careful how I put these questions.

Mr. Huber wanted me to come to see this case at once as he had to take his milk to Coffeen for an early train and he also seemed much excited about the cow. As the roads were very muddy that morning, I told him to go ahead and take his milk and I would try to be there when he returned as he had only four miles to go but with a horse and buggy. However, I made good time as "old Liz" for once performed beautifully, and I arrived at his place some fifteen minutes before he returned.

I fully expected to find a case of forage poisoning as I knew this man to be a poor feeder, having done his work for several years. When I drove up, Mrs. Huber came out and stated the cow was in the barn. I looked the herd over as they stood in the stanchions but could not find any that appeared sick in any way. I then went out back of the barn and through some sheds, when I saw two cows munching at an old straw pile about two hundred yards from the barn. I walked slowly towards them but could not get closer than about twenty steps and could see nothing wrong, although I did notice one was red and the other a roan. The roan cow stumbled over a low wire as they went out of the straw lot. The two then browsed off down the pasture as though nothing was the matter.

I went back to the house and asked Mrs. Huber if she knew which cow seemed to be ailing. She said, "Yes, the roan one, and why, was she so much better?" I said I could see nothing wrong but would drive them in the barn for closer observation. Both cows were by now trying to pick the short dead grass. I also noticed part of a load of frozen silage that recently had been unloaded in the pasture. While driving the roan cow back to the barn, I could just barely detect a slight swaying or weaving motion in her stride, which I believe is sometimes termed incoordination.

Just as I reached the lot, Mr. Huber drove up and after exchange of greetings, I remarked, "Well, the cow must be better." But he did not seem to think so. We drove the cow in her stall without any trouble, but then things began to happen. We could not induce the animal to put her head in the stanchion where she had been accustomed to stand for several months to be milked. She seemed very nervous and kept up such a dancing with her hind feet and swaying of the body that I could not examine her in any way.

I then put a lead in place and drew her head up close to a post, but this excited her so that we replaced the lead with a halter, after which she became quieter, and I noted the following:

The cow was six years of age, weight about 1000 pounds, in good flesh but not fat, history none except that she was supposed to be about three months pregnant. I learned later by manual examination that the cow was not in calf at all, and the owner stated the animal had been fresh four months previously. The pulse was highly accelerated, muzzle dry, eyes somewhat obtruded and vision appeared clouded but the pupils were not dilated, temperature 99° F. She would not eat nor drink. The breathing was labored, which had not been noticed when the animal was in the pasture. There was a frothy drooling from the mouth, which was not present until after the patient was tied. Peristalsis was barely audible, but the bowels had moved when the cow was being driven to the barn and the feces were normal. Soon after being confined, the animal voided urine, which was highly colored and thicker than normal.

I decided to watch the patient for a while before attempting treatment as I surely was puzzled by this train of symptoms, and had this been a fresh cow I should have given the milk fever treatment at once.

By this time it was hard to tell which was the more nervous, the owner or his cow, and he kept wanting to know, "What ails her, Doc?" and could I save her? Finally he mentioned in a nice way calling my competitor in that section for consultation. I said we would wait a while as I saw no danger of the cow dying at once at least.

The cow would back up to the end of the halter rope and kick the side of the barn, first with one foot and then the other. She could kick faster than I thought possible for any animal, although the owner stated the cow had never kicked before. Then she would crowd forward against the manger, lie down and remain quiet for possibly five minutes, then rise and repeat the kicking, weaving and dancing. Twice she went through contortions highly simulating abnormal sexual excitement, although there were no normal symptoms of estrum.

We then examined the feed, which consisted of cow peas, corn, corn silage, oil meal and ground oats. All appeared in good condition, except the ground oats smelled musty as did the whole oats in the bin, caused from being stored while wet. I then told the owner quite frankly that I did not know what ailed the cow but suspected poisoning from the musty oats and gave a guarded prognosis.

I gave one-fourth grain lobelin sulphate hypodermically, two ounces of elixir purgans in capsules and three tablets of sulpho-carbolate compound. I did not leave anything for the owner to administer as he was afraid to go near the cow, the peculiar symptoms and the frothy saliva seeming to indicate rabies to him. I will state here that I have learned to be very careful what I leave for the owner or attendant to give in the way of medication. Oftentimes it is more advisable to leave some harmless placebo and a dose syringe to give it with than to leave highly potent drugs with which to drench the patient. Drenching any animal, even by experienced practitioners, many times does more harm than good, especially when the patient is exhibiting cerebral disturbance.

It is almost unbelievable how brutal and ignorant many stock owners are when trying to drench an animal. Some owners will drench through the animal's nose even after being warned of the danger. I have long since quit passing the stomach tube by way of the nares. I use a speculum and pass it through the mouth. Some strap the mouth tightly shut and do not use a speculum.

I advised the owner to leave the animal tied and to put in plenty of bedding. As the wind was raw, we closed the doors and all windows but one, and as the patient was somewhat quieter by now and was lying down, I placed a horse blanket over her, which to my surprise she did not resent, but I suppose the lobelin had by then taken some effect.

It was now about 9:30, so I left, telling Mr. Huber to call me about 3 p. m., and if I should be gone, to leave word if I was to call again to see the cow that day and how she was doing. I was at the office at 3 p. m., and as the owner had not reported, I telephoned him and learned that the cow seemed much improved, although she would not eat nor drink, but was quiet, still lying down and chewing her cud. I gave instructions to leave a pail of water before her and feed anything she could be induced to eat in moderate amounts, except not to feed any more of the musty oats to any of the stock.

As to the frozen ensilage I had seen in the pasture, the owner stated the cows had not eaten any of that as he had placed it there the previous evening late after the cows had been stabled for the night.

I called the owner the next morning, and he reported the cow was doing well as far as he could tell. She had a good appetite and drank plenty of water. I heard no more from the case for a week, when Mr. Huber called at the office and said the cow had completely recovered and was giving her usual flow of milk.

I still think this was a case of feed or forage

poisoning, either caused by ingestion of the old straw or the musty oats, and yet the unusual symptoms of sexual excitement seem peculiar as I never saw them present before in any kind of poisoning. I should be glad to have practitioners comment on this case, either in the way of criticism or otherwise.

E. J. Bess

Fillmore, Ill.

## TRAUMATIC SCROTAL HERNIA IN CALVES

On May 12, 1925, I was called by a merchant here in the city, who runs a ranch as a side line, to make a call to the farm, a distance of about 15 miles, to see some recently castrated calves. On asking him what the trouble was, I was informed that he did not know but that the foreman had called him saying that one of the calves was in bad condition.

We drove to the ranch, and on arrival the foreman told me that two of the calves that were castrated the day before were ruptured. The condition had been noticed early in the morning on one of them and about noon on the other. This was about six o'clock in the evening. On going into the pasture, we found a herd of 450 steer calves that had been castrated the day before and another herd of about 300 that had not been castrated. These were a mixed lot of calves, some of good quality and some very poor. They were all in very good condition for range stock in the spring, which means they were thin in flesh but strong and healthy. All of them had been dehorned about four weeks before. Their heads were in bad condition and had been treated for maggots when they were castrated. This was due to the late dehorning as the owner had bought these steers after selling all of his good quality calves, saying he was going to try a cheaper grade of cattle in the hope of making some money out of them. Conditions here among stockmen are very bad and have been so for a number of years, so they try all grades of cattle to eat their grass in an attempt to get by. I mention this to show the situation with regard to the cattle in question—thin in flesh but strong, sore heads with maggots in the dehorning wounds, no feed except what they could pick up in the pasture, the green grass of which was still too soft for good feed and the old dry grass pretty well eaten off. However, cattle of this class do well under such conditions. This was all noticed while going through the herd on saddle horses as these cattle will fight a man on foot.

We were at last shown a nice grade Hereford steer standing off alone, not eating and looking more dejected than the others. His head was in a very bad condition with pus streaming down over the sides of his face. His scrotum seemed to be swollen, his gait was stiff, but no intestines could be seen. I mentioned this to the foreman and was informed that the intestines were out when the calf was first seen but had been replaced by the foreman. The calf was caught and placed on his back, when it was seen that his legs and belly were literally covered with sand burrs and cockleburs. The scrotum was hard, swollen and closed at the bottom. I was told the foreman had found this calf with a "handful of guts" out and had tried to replace them, but being unable to get them back, had stuffed them into the scrotum and sewed the end with a shoe-lace, using the punch blade of his knife as an awl. I was also informed that the intestines were scratched by the burrs. Of course, I gave a very grave prognosis in a case of this kind, but as we were on the ground, I proceeded to do my best.

First I cleansed the scrotum, inside of the thighs, belly and in fact the entire rear parts of the calf as best I could with a brush, then washed the scrotum with a 2 per cent lysol solution and wet the adjacent parts with the same solution to keep the loose hairs from getting into the wound. The shoe-lace was then removed from the end of the scrotum, when the intestines imprisoned in it came out. They were badly swollen and abraded by the burrs which had rubbed against them when the calf was walking. I cleansed them the best I could with a flavine solution, using it on my hands while trying to replace the intestines. However, due to the fact that the wind was blowing and the pasture was sandy, I could not keep them clean. Finding that I could not replace the intestines with the patient in this position, we dragged the calf about 100 yards to a tree and tied a single-tree between his hocks to spread his legs, then tied a lariat rope to the single-tree and passing the rope over a limb of the tree, raised the hind quarters about two feet off the ground, when the intestines were easily replaced in the usual manner.

The peritoneum was sutured with chromic catgut and the scrotum packed loosely with cotton soaked in flavine solution. This was used on account of its antiseptic action and also because it is non-irritating, and in this place there had already been too much irritation. The cotton was held in place by two sutures in the end

of the scrotum, and instructions were given to remove the packing sutures in forty-eight hours. I also tied a piece of bandage to the cotton so that removal was easy as the end protruded from the scrotum. I again told the owner I thought the animal would die and went to look for the other calf.

We found him, a thin, roan calf of very poor quality. His head was about all healed up, but he seemed to be in considerable pain. We drove him to the operating table, namely, the tree, and he lay down three times while going about a quarter of a mile. He was caught and thrown the same as the other steer, and after preparing the operative area, I found that this animal had been treated the same as the other except that the end of the scrotum had been stitched up with wire. This was removed and the intestines treated and replaced as in the first case. However, the intestines seemed to be in much better condition than in the other calf.

The operation was completed in a manner similar to the former one and the same instructions were given. The instructions were to remove the packing in forty-eight hours and turn the animals out where the feed was a little better. There is no use giving one of these old ranchmen any instructions that will require care of a calf more than once. They will remove packing and turn a patient out on a little better feed if it is handy, but that is all they will do. However, if an entire herd is involved, they will treat them, as in the case of the maggots in the dehorning wounds.

I inquired as to the cause of these ruptures but could get no light on it. These people castrate a great many calves every year with no trouble. However, I learned they had a new cow-hand doing the roping, and he was mounted on a good calf-roping horse and worked very fast. The usual custom here is to rope a calf by both hind feet and let the horse drag him out of the corral to the fire where the calf is branded and castrated, then turned out. A calf is seldom injured by this method, but this new man would rope only by one hind foot and the calf would dig the other in the ground and struggle while being dragged out by the horse. I told them I believed this was the cause of the trouble, to which the foreman agreed, but the merchant owner did not, as he liked the new man since he was a very fast worker.

On May 18th I was called back to the same ranch and found another small red steer calf tied down on his back. I was informed that when they castrated the animal his intestines came out, so they had tied him down and waited for me to come. This calf was among the first fifty they had castrated that day. The steer was prepared and put in position as had been done with the others before. The operation was completed in the same manner and the same instructions given. This calf's intestines were in good condition as they had not been out long. The other two calves were still alive but looked bad and ate but very little, seeming to be very weak, with a constant drip of serum from the scrotum. This time I watched the method of handling the calves and was convinced that it was the cause of the trouble. They changed to the old style of catching the animals by both hind legs, and although they bought and castrated over five hundred since, they had no more trouble of this kind.

On June 20th I went back to this ranch to vaccinate for blackleg and saw the three steers in question. The little red steer operated on May 18th was in fine condition, except that his head was full of maggots. Steer No. 1 was very weak and thin. His head was still in bad condition with plenty of discharge and maggots, and he had a scrotal fistula through which it seemed all of the feces passed. He had lost about 150 pounds in weight and looked like a total loss. Steer No. 2 was also very weak but not so thin as No. 1. His head was in good condition, but there was a very free leaking of feces through the scrotum, about one-half of the feces passing through the natural channel as nearly as I could estimate. I advised that these two calves be killed and fed to the hogs, but instead they were vaccinated and turned out with the rest of the herd.

On July 27th I went over the herd to see about the maggots in the steers' heads and found that steer No. 1 had some maggots in his head but was much stronger and seemed to be picking up in flesh. The discharge from the scrotal fistula seemed about the same, although he seemed to be passing some feces through the anus. Steer No. 2 was strong and doing pretty well, the discharge from the scrotum being entirely stopped. This was the last time I saw these steers until they were brought to town to be shipped out, November 18th, when the merchant owner took me to the stock yards and pointed out these three steers to me.

They were all fat, and although Nos. 1 and 2 had made very little growth, No. 3 was as large as any of his age. They were going at the same price as the others. We caught Nos. 1 and 2 and examined them for hernia or fistula, but except for a thickening of the scrotum, could find no evidence of the trouble.

These cases are to me unusual in that they show recovery under the most adverse conditions with no treatment and no care. This is written to show the practitioners in some other parts of the country what sometimes occurs in a practice in a farming community where small farms are the rule but nevertheless it has some of the aspects of a practice in a strictly range region.

The treatment used by stockmen in this locality when they have maggots to contend with is, if the entire herd is affected or a large number of animals, to build a corral in the pasture, then run the cattle through a narrow shute and inject a two-ounce dose syringeful of crude oil to which has been added four ounces of Kreso dip to the gallon.

F. F. Meads, D. V. M.

Cherokee, Okla.

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## ATONY OF THE SYMPATHETIC NERVOUS SYSTEM IN A COW

On November 18, 1925, I received a call to attend a Jersey cow, six years old. On arrival I found the owner had made his own diagnosis, stating the ailment of the animal was difficult parturition. I absolutely disagreed with him and some of the neighbors. My diagnosis was partial atony of the sympathetic system of the thoracic, the great splanchnic, the semilunar ganglia and the solar plexus nerves.

The great splanchnic nerve is detached from the sixth or seventh ganglion and receives in its backward course additional fibres from all the other ganglia except the last two or three. It enters the abdominal cavity in company with the psoas muscles, when it presents a small ganglionic mass, and is then bent inward and terminates in a large ganglion, the semilunar or solar ganglion. The semilunar ganglia are the largest of all the sympathetic ganglia. On the inferior face of the aorta, these filaments form the solar plexus, which receives branches from the superior cord of the par vagum and is divided at its periphery into numerous secondary plexuses from which many ramifications interlace and anastomose in a very complex manner around the divisions of the arteries, which they accompany into the neighboring organs. Of these secondary plexuses the gastric distributes its branches to the stomach where they anastomose with the pneumogastric nerve. These nerves supply the liver, duodenum, pylorus, pancreas and in part the spleen and kidneys. When we think of the afferent and efferent branches of the sympathetic nervous system and the many parts they play, we cannot refrain from considering their role in the treatment of what some term atony of the rumen. I should term it atony of the rumen, reticulum, abomasum and their relations.

When I meet with these cases, I proceed with treatment according to the symptoms presented. Some may term it impaction of the rumen, but that does not spell anything to me. If there is an impaction, there is a cause for it, and my experience has taught me that if I do not attend to the nervous system my treatment is of no avail.

The history of this case was that the cow had been with the rest of the cattle in good surroundings, the feed being hay and corn of good quality. Parturition was almost at hand, but my diagnosis was other than that. The symptoms presented indicated depression of the sympathetic nervous system of the digestive organs. The prognosis was favorable.

The animal was in a very weak condition, lying down, unable to get up and not far from being comatose, but she responded very nicely to the treatment applied. I do not always give the owner my diagnosis and prognosis until I have partly or entirely completed the treatment for various reasons.

My line of treatment in this case was as follows: nux vomica, ginger, gamboge, magnesium sulphate; also two fluid ounces of camphor, 20 grains, salicylic acid, 15 grains, turpentine, 120 minims in a special preparation of capsicum and ginger. By combining the purgative and fluid stimulant, I have greater success in obtaining recovery. I would not omit the purgative, neither would I omit the stimulant. Both are indicated, the purgative to supply the digestive organs with material that will induce them to function, the stimulant to strengthen the nervous system. I combine all my medicine with five to seven gallons of warm water in each and every case of this kind and pump it into the rumen, which I did in this instance. In two hours the cow was on her feet and could walk without much difficulty. She made a complete recovery and gave birth to a live calf in three days without assistance.

I have read in Veterinary Medicine where some veterinarians stated they had no success using water in the quantity I give. It has been very successful with me, so that I do not care to omit the water. I have discovered that both bovine and equine subjects will not drink water while they are in this condition. This being the case, I think the glands do not have enough

water to perform their function. Also all organic matter requires a certain amount of $H_2O$.

J. F. Abel, M. D. C.

Wapello, Iowa

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## EMACIATION AN IMPORTANT SYMPTOM IN DISTEMPER

My view is that the true uncomplicated nature of distemper is merely that of a generalized catarrh of all mucous membranes, and that the various inflammations which may later complicate it are due to the spread of organisms to other parts. Chorea, for instance, appears to be due to an extension of infection from the middle ear or roof of the nose, to the meninges, thereby causing a meningitis.

Only in a comparatively small percentage of cases have I registered initial temperatures in this disease as high as 106° Fahr. I do not find that distemper is an acutely febrile disease, for, after a series of observations, I was able to record a temperature of 104° in only 5 per cent of cases.

There are two symptoms which are very intimately connected with distemper. One is emaciation and the other preputial catarrh. Emaciation is especially characteristic and has been frequently noted in the early stages, long before diarrhea, pyrexia, or other contributory symptoms had occurred. In the book on "Canine Distemper," which I recently published, I laid particular stress on this point, in the following words: "Emaciation, in greater or less degree, is practically inseparable from distemper, and where it gains a firm hold it bodes ill for the patient's prospects of recovery. There is always a certain amount of wasting, even in those cases which are of the benign and transitory type, and it is sometimes difficult to explain why there should be. I have known it to become very marked in dogs which have been most liberally fed on the best of nourishing food, and which have never had a temperature higher than 102° F. during the two or three weeks' course of their attack. It is to be most feared where its development is rapid, and the accompanying diarrhea of a very stubborn exhausting nature, and there is a perceptible increase of weakness, together with a peculiar and obnoxious body odor. These signs are prognostic of a fatal termination." As regards the other symptom, it is not uncommon to find a discharge from the prepuce prior to or during an attack of distemper, and it is a factor which has some diagnostic value.—Hamilton Kirk.

## FOLLICULAR MANGE IN A DOG

On September 16th, Dr. F. brought his Fox Terrier bitch to my office for examination, for treatment, or to lay her away. I must confess that the animal was a pitiful sight and I was tempted to advise destruction. The dog had been treated for the previous ten months by a number of veterinarians who diagnosed the condition anywhere from eczema to sarcoptic mange. Skin scrapings had been made by some, but the findings proved negative.

I was satisfied that the ailment was not sarcoptic but follicular mange, although the skin was very reddened, which I attributed to an erythema, and the skin scrapings had evidently not been made deeply enough, accounting for the negative results.

After due deliberation, I decided to try the violet ray high frequency current with a surface electrode and to give the patient two drops of Fowler's solution three times a day in addition, although the latter had been given at other times before.

The following letters from the owner will indicate the progress of the case. The first letter was written after three days' treatment, and I then suggested to give the dog a few shots of acne combined vaccine as the condition appeared to be complicated with acne. I also suggested to use some soothing ointment that the doctor might have as well as antiseptic baths. Likewise I telephoned the owner to use the P. D. & Co. follicular mange vaccine No. 820.

September 18, 1925

Dear Doctor: Relative to the Fox Terrier that you saw two days ago, I followed the suggested treatment, i. e., using the surface electrode with the high frequency current, and the results in twenty-four hours are quite startling. I gave her one treatment as soon as we returned from Manchester and three yesterday, and instead of about one hundred new pustules showing up as heretofore has been the case, this morning there were but three that we could discover. Yesterday, the dog did not appear to be so sleepy, ate better, and certainly took more notice of what was going on. Her ears do not feel so tough and leathery, nor do the folds about her neck and shoulders, and I notice many of the scabs have dried and are coming off. Now, I know as well as you do that in this very short period of time, one cannot tell a thing as to ultimate results, but it is self-evident that your line of treatment has done more in twenty-four hours than all the lotions, ointments,

powders, etc., heretofore prescribed. I might add that we give the pup internally Fowler's solution, gtts. 3, three times a day. I feel certain, as does Mrs. F., that had we brought the dog to you in the beginning, she would now be as well as ever.—F. B. F.

September 23, 1925

Dear Doctor: Thinking you may be interested to know of the progress of the little Fox Terrier, will say that we think she shows marked signs of improvement. There are but very few new sores—this morning but one very small one—and the edema appears to be subsiding rapidly. I use the violet ray three times a day, have evacuated all the old sores and touched up the evacuated areas with Mercurochrome 2 per cent, give her one-half cc. Sherman's streptococcus and staphylococcus every second day, wash her thoroughly in a Chlorazene solution daily and apply an itch ointment put up by the National Drug Co. She eats well, plays quite a little and acts more like a dog and not like a walking corpse. On her head and ears which itched so terribly, I use clear Obtundia, and have seen no sores or pimples for several days. Altogether Mrs. F. and myself spend about six hours out of the twenty-four in attending to the pup, and we consider the time well spent because of the results shown so far. Now, whether this line of treatment will ever effect a cure, the Lord only knows, but to date we are getting results. I shall try, before cold weather sets in, to bring her over to see you.—F. B. F.

November 2, 1925

Dear Doctor: I am glad to be able to tell you that the little dog is about well so far as the mange is concerned, it being certainly two weeks since any sore or sign of a sore has been noticed, and I can assure you that she is watched by Mrs. F. as closely as though she was a child. The hair is starting nicely on the back of the neck and shoulders as well as on the chest and sides of the neck and face, they being as you may recollect, completely bare. The edema has long since gone, and the skin seems to be in very good condition so far as I am able to judge. Needless to say that from a half dead dog, she has developed into about as lively a Fox Terrier as one could wish for, eating well and sleeping no more than one might expect. I discarded the acne vaccine for the reason that its use appeared to greatly aggravate conditions, causing a reaction that to me did not seem good, but the P. D. & Co. No. 820 certainly worked wonders together with the violet ray and the National Itch Ointment. Of the three, I confess that I am biased in favor of the vaccine because from the initial dose we could observe marked results, but there is no reason in the world to doubt that the other things played a very important part. There is also no question in my mind that had it not been for your suggestions and advice, by this time the little dog would have been laid away. So we give you all credit for the apparent cure, and should you at any time wish any client to communicate with me regarding your ability in re mange, I certainly will be only too glad to say what I can in your favor but naturally keeping mum regarding any advice or suggestion about the treatment. At present I am giving 1 cc. of the 820 once a week, and that is all that is being done for her.—F. B. F.

A. C. Pfefferkorn

Manchester, N. H.

## GASTROTOMY IN A CAT

Two years ago a woman brought to my office a very fine, big, red, male cat, which she declared had swallowed a hundred dollar bill that her husband left on the table. This happened two or three days before Christmas, and the woman was in a quandary as to what to do. I suggested an emetic and gave the cat 1/20th grain apomorphin. It made the animal quite ill and quantities of saliva dribbled from the mouth and changes were noticed in the eyes. However, he was a strong cat and little damage was done, but no paper money appeared.

Dr. John F. Bullard, formerly with the Kansas State Agricultural College, Manhattan, Kan., has joined the Agricultural Experiment Station, University of Kentucky, Lexington, Ky., his new appointment taking effect February 1st.

The owner consulted her banker, and he told her if the figures could be rescued it would be O. K. She consented to have an operation performed on the cat to recover the money. The animal was anesthetized with ether, hung up by the hind legs, an assistant taking care of the front paws, and the body was covered with gauze. I made an incision into the abdominal cavity. The cat was very fat and a large portion of omentum came out. With a little traction I pulled the stomach out and made an incision in the pylorus, but no money was found. The stomach was practically empty, containing

only mucus. So I sewed up the animal and the owner took him home.

A few days later she called up and told me that quite an amount of pus had formed in the wound. I told her to keep it clean with alcohol and balsam of Peru. I did not hear any more about the case until a short time ago, when the cat was brought in to be chloroformed as he was affected with eczema.

A hernia had formed at the site of operation. Perhaps the destructive claws of the cat caused this condition, also the pus formation. The owner claimed the cat bloated after swallowing the money, but they found the hundred dollar bill elsewhere later, after the major operation had been performed, so the woman must have suffered from hallucinations.

The trouble with veterinary operations is that they have to be performed so cheaply and without sufficient help. With large bitches, spaying is almost as serious as a goitre operation. I believe in all cases surgical openings should be large enough to enable proper handling of the parts.

Veterinary Student

## RABIES IN DOG, HORSE AND COW

Sometime about the middle of February, 1925, a German woman and her daughter came to my office to inquire about a little dog they had at home in the country, about three miles away, as the animal was acting strangely. These people spoke very broken English, and it was hard for me to understand much of what they had to say. However, after a good deal of questioning, I made up my mind that they had a case of rabies to contend with. But they insisted that the dog had never been bitten and could not have rabies. I informed them that I ought to see the dog and either I should go out to their place or they should bring the dog in. They would not consent to either proposition, so I told them when they got home to put a collar and chain on the animal and fasten him in the corn crib, putting water and feed where he could get it, but to be sure to keep everybody away so no one would be bitten. I warned them about handling the dog, telling them of the danger of a bite from a rabid animal or from the saliva getting into a raw wound on their hands. I also informed them that if the dog had rabies, he would be dead in three or four days, and if they would let me know when he died, I would come out and cut off the head and send it to the state laboratory for microscopic examination.

I did not hear from them again until March 4th, when Mr. Myers brought a team of horses to my office to have one of the animal's teeth dressed. This was a bay mare, eight or nine years old, weighing about 1100 pounds, in moderate flesh. I examined her mouth and found a few rough edges along the outside of the molars. While I was examining her and floating her teeth, she grabbed at me a few times. I said to the owner that the mare was a pretty sour old thing, but he did not make any reply, just merely grunted. When I got through, I helped him hitch up the horses, and away he went. I did not see anything particularly out of the way with the mare, only that she snapped at me once or twice while I was working on her.

Early the following morning, the telephone rang, and it was Mr. M. at the other end of the line, He said, "Say, Doc, come out right away and see that old mare, will you? She has gone crazy."

I was eating breakfast at the time, and as soon as I had finished, I got my car and started. Up to this time, I had thought nothing further about the dog that this man's wife and daughter came in to see me about. When I got about half way, it came to me about the dog. I stopped my car and began to look my hands over to see if I had any scratches or sores on them. As there were none visible, I felt relieved.

On arrival at the farm, I found the whole family greatly excited, as well as some of the neighbors who had been called in. On his way home the afternoon before, Mr. M. stopped at a neighbor's place, tied the team to the fence and went into the house. He had just gotten inside when he heard a racket and stepped out to see what it was. The mare had walked through the fence and fallen down, getting all tangled up. After liberating her, the owner went home, put the horses in the barn, took off their harness and tied them up. He watered and fed them, but this mare refused to drink, and he put hay and grain in the manger and went in the house for the night.

Late that night he heard a great commotion at the barn and went out to see what it was. When he opened the stable door, the mare darted out past him. She had torn down the manger and stall, and harnesses were strewn all over the barn floor. His wife called the neighbors, and after a while they managed to get the mare into a cattle shed, and that was where I found her when I arrived.

The mare was very nervous, would chew on the manger every few minutes or at some old cornstalks that were in the shed, switch her tail,

urinate and strain as if in estrum. In one end of the shed was a galvanized water tub turned upside down. The animal would whirl and grab at it occasionally. After watching her for a while, I asked the owner what became of the dog his wife and daughter came to see me about some time before. He said that it died. I then asked if it bit this mare, and he replied, "No, it just nipped her on the heel a little bit."

We got a gun and put the mare out of the way. After the animal was killed, the owner's wife said, "It's a funny thing how some dog comes along and bites our little dog and our dog bites a horse and they both have to die."

I asked, "Did some dog bite your little dog?" She said, "Yes." I then told her when she came to see me that she said her dog had not been bitten. She replied, "Well, I forgot about it."

On Sunday, December 20th, I was called again to this same farm to see a cow. This cow, a five-year-old Holstein, was suckling a six-weeks-old calf. She was chained to the manger with a regular cow chain and a big inch rope around her neck and tied both ways to posts. She had pawed a hole in the ground deep enough so that she was nearly standing on her head. History showed that about four weeks before a stray dog was seen chasing the cows. The owner drove the dog away. He did not know whether any of the cattle had been bitten, but the following day his wife went down the lane to hunt her turkeys and saw this same dog all curled up in a fence corner.

The owner had not noticed anything wrong with the cow until the day before I was called. The animal was out in the barnyard, continually bellowing and chasing the chickens. Finally he got her in and tied her up. She would neither eat nor drink but just bellowed and pawed the hole in the dirt floor of the shed that I found her in. She would switch her tail and eject a little urine every time I went near her. Her bowels were quite loose. I had the owner get a pail of water and put in the manger. The cow would put her nose in it, then bellow and paw but did not drink any. I informed the owner that it was a case of rabies. The calf was taken away from her. I left orders that the cow be kept securely tied and not to let any one in to see her for fear of their getting hurt.

I saw the animal the following day when the symptoms were about the same, except instead of the bowels being loose, she passed very hard, chocolate colored feces slightly coated with mucus, and she twitched at the mouth some.

On December 22nd, I called again. This time the cow was down, paralyzed behind. The dog came in the shed, and she immediately began to bellow and tried to get at him. I told the owner we had better put the animal out of the way, so he got a gun and sent her to the happy hunting grounds.

H. Fulstow

Norwalk, Ohio

## INFECTIOUS HEMORRHAGIC GASTRO-ENTERITIS IN A DOG

This condition is commonly called canine typhus or black tongue. A case brought to my hospital on November 14, 1925, was a male Shepherd dog, about five years old, weight about 45 pounds, very thin and emaciated, eyes sunken and inflamed, saliva dripping from the mouth, coat harsh and lustreless, temperature 106° F., pulse 60 to 80 and irregular. The animal was unsteady in his gait and seemed very weak. His nose was very dry and he breathed with difficulty. The tongue was coated with brown saliva, also the teeth.

The owner said the dog had been sick about four days. He was first noticed to be very droopy and taking no interest in life with no appetite but very thirsty. About the third day it was noticed that saliva was drooling from the mouth, and the animal would stand over the water and try to drink but could not as the throat seemed sore. The owner had not noticed the stools or urine but thought the dog must be constipated as he had not moved away from his bed except to drink. As the dog was a great fighter, the owner thought the condition might be rabies and brought him in.

Diagnosis, black tongue. Prognosis, guarded but very grave.

Treatment: Isolation in a warm, airy kennel, washing the eyes, nose and especially the mouth and teeth with a saturated solution of boric acid, being careful to remove all the brown fetid saliva from the tongue and teeth. Vicks' Vaporub was inserted in the nostrils, and for the bowels an ounce of mineral oil was given twice daily, also an enema of warm, soapy water. I found that the bowels were in fair condition. The urine was dark in color and rather thick, and for this I gave 14 grains of urotropin twice daily. Two tablets of intestinal antiseptics were also given twice daily.

Two days after the dog was admitted to the hospital, on washing the mouth I noticed a necrotic spot on each side of the tongue, about two inches from the tip, which gradually spread to the tip, and in about four days the whole area sloughed leaving a raw surface which bled considerably but which healed up nicely in a few

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days. During all this time the patient was fed six raw eggs daily, some beef broth and water, poured down by making a pocket of the animal's lips and letting him swallow slowly. He seemed to have difficulty in swallowing due to the condition of his tongue. When the tongue healed, he seemed much better; the temperature came down to 103, respiration and pulse nearly normal, and he took more interest in his surroundings. About this time he developed a nasty diarrhea, the fecal matter being very fetid and blood streaked. I immediately stopped the oil and intestinal antiseptics and gave milk of bismuth, two tablespoonfuls every three hours, until the stools became more normal. They continued loose for about four days, but as the patient's appetite seemed good and he had started eating a little raw red beef and could lap his eggs, I was not alarmed. I then put him on triple arsenates with nuclein, giving two pills three times daily.

He made a nice recovery and went home on December 5th, a healthy looking dog, his coat slick, and having gained about ten pounds in weight. In taking his temperature every day, I found it ran an even course from 102° to 104° F.

Black tongue and distemper are somewhat similar but should not be confused when one notices the saliva dripping from the mouth, the dry appearance of the nose, temperature not so high as distemper and the absence of the sickly sweetish smell from the stools that is so diagnostic of distemper. In my opinion, black tongue is not as contagious as distemper. I have treated a number of cases and it never spread to any other dog at my kennels. Where distemper has been one will always get a number of cases from that locality, but I have never had more than two cases of black tongue at one time.

The following are my reasons for the use of the medicines as given in the case just described:

Vicks' Vaporub is an excellent lubricant for the nostrils and is healing for the lungs.

Urotropin or hexamethylenamin is a very good diuretic, a solvent of uric acid and causes profuse micturition.

The intestinal antiseptics contain zinc carbosulphate, sodium sulphocarbolate, carbolic acid, eucalyptus and menthol, all of which are disinfectant and healing to the bowels.

Milk of bismuth has always been noted as the best bowel astringent known. It allays cramps, reduces inflammation and puts a covering over the raw mucous membrane of the bowel, thereby stopping hemorrhage.

Triple arsenates with nuclein contain strychnin, 1/128 grain, the best heart and nerve stimulant known; quinin arsenate, 1/64 grain, given to reduce fever; iron arsenate, 1/64 grain, acting on the digestive tract and giving an appetite; nuclein solution, minims 4, given to build up the nuclei in the blood cells, giving the blood more strength to fight off invading organisms.

Los Angeles, Cal. F. H. Bescoby, V. S.

## SKIN LESIONS IN CANINE DISTEMPER*

One sees cases of distemper, even from the outset, in which no exanthema develops, and I would venture to say that there is a fair percentage of cases in which, at no time during the course of the disease, does any particular skin lesion develop. Moreover, even in those cases in which it appears, its appearance does not always coincide with the initial aspects of the disease; often when one meets with skin involvement in distemper it arises at the later stages of the disease and may have no relation to the vesico-pustular type of lesion. Such involvement frequently takes the form of what, for want of a better word, I would call catarrh of the skin, in which the epidermis is thickened, the coat rough and harsh to the touch, with loss of hair and a profuse production of scales, amounting in some cases to a type of pityriasis.

Can one be quite sure that the eruption, when occurring in the early stages of the complaint, is the same as the condition met with in the later stages, when the animal has become prostrate from a serious complication? In the later condition the skin has a pitted appearance with a large amount of serous discharge, often very similar to the pustular form of follicular mange.

To my mind, such conditions as the latter are due entirely to secondary infection and cannot be regarded as indicative of distemper per se.

In such a debilitating disease as distemper, there is a natural tendency to secondary skin infection favored by the lowered resistance of the patient. An example of this is seen in the common association of follicular mange with general debility, no matter from what cause the latter may arise.

I am quite prepared to admit the presence of a rash on very young puppies, but again, to my mind, one cannot attach extreme diagnostic importance to it, and the fact that in such young puppies the site of that rash is on the undersurface of the abdomen, where soiling by natural discharge is common, carries considerable weight.—H. W. Dawes.

* From discussion of "Clinical Aspects of Simple Distemper," The Veterinary Record, No. 52, Vol. 4.